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# INTERNATIONAL ABSTRACT OF SURGERY

JULY, 1919

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Escudero, P.: Occlusion of the Mesenteric Vessels as a Postoperative Complication** (Obliteración de los vasos mesentéricos como complicación postoperatoria). *Rev. Asoc. méd. argent.*, 1918, xxxix, 625.

Occlusion of the mesenteric vessels usually begins suddenly with abdominal pain or at least peri-umbilical tympanism, local or generalized, a very rapid and weak pulse, variable gastro-intestinal disturbances, vomiting, hæmatemesis, constipation or diarrhoea, dyspnoea, slight cyanosis, and variation in temperature. The condition may occur immediately after an operation or after a period of latency which may last for several days.

The differential diagnosis must take into consideration peritonitis, acute dilatation of the stomach, acute hepatorenal insufficiency, and acute pancreatitis.

The prognosis of occlusion of the mesenteric vessels is always grave. All postoperative cases have been fatal.

Early operation is the only treatment which gives a chance of recovery.

The author gives the histories of three of his own cases, two of which ended fatally within three days after an abdominal operation. The third case developed a month after operation and also ended fatally. In the literature up to 1913, he found 360 cases of post-operative thrombosis of the mesenteric vessels, only 13 of which were correctly diagnosed. In two of his own cases the vessels showed signs of syphilitic involvement.

W. A. BRENNAN.

### ASEPTIC AND ANTISEPTIC SURGERY

**Whittingham, H. E., and Glasg, C. B.: The Occurrence of Morgan's Bacillus in Chronic Discharging Wounds.** *Brit. M. J.*, 1919, i, 306.

At the Poor Law Infirmary it was observed that certain patients with deep wounds did not do well but developed chronic discharging sinuses with a foul-smelling discharge and general toxæmia.

To determine the causative factor, a bacteriologic examination was made of the wounds of all new patients on admission and repeated weekly. The initial findings showed usually a mixed infection of staphylococcus and streptococcus viridans, and occasionally *B. pyocyaneus* and *B. perfringens*. In about two weeks 5 out of 20 cases revealed the presence of Morgan's No. 1 bacillus which soon became the predominant organism and gave to the wounds the appearance noted. Its characteristics were usually constant, viz., it was Gram-negative, feebly motile, fermented glucose with the production of acid and some gas, did not change lactose, saccharose, mannite or dulcitol and rendered litmus milk slowly alkaline.

Indol production was distinct in all but one case. Examinations of the fæces were negative for organisms of the dysentery group. The dressings used were not contaminated. Agglutination of the isolated bacilli with the patient's serum was negative except in one case in which a dilution of 1 to 40 was positive. Four patients responded well locally and generally to autogenous vaccines after 4 or 5 inoculations.

The source of the infection was unknown, but contamination through dust was considered a possibility.

E. M. MILLER.

### ANÆSTHETICS

**Spick: General Anæsthesia in War Surgery by the Pellot Apparatus** (L'anesthésie générale en chirurgie de guerre avec l'appareil de Pellot). *Bull. méd.*, Par., 1919, xxxiii, 176.

War surgery calls for an anæsthetic which induces anæsthesia rapidly, does not cause vomiting, can be used for "gassed" patients, will not increase existing toxicity, and is without danger when administered by assistants who are not trained anæsthetists.

After many trials Pellot succeeded in preparing an agent possessing these qualities and a special apparatus for use in administering it. Pellot's anæ-



thetic consists of a mixture of ethylchlorid, ether, and chloroform in the proportions for each 20 cc. of 15 cc. of ethylchlorid, 3 cc. of ether, and 2 cc. of chloroform.

According to Spick, anæsthesia can be obtained by Pellot's method in fifteen minutes with 20 cc. of the mixture, re-awakening is easy, and subsequent complications are rare.

Since April, 1918, Spick has used the Pellot apparatus in all of his cases of war surgery, numbering 584 and including laparotomies. In 564 cases the anæsthesia induced was perfect and not attended with nausea, in 8 it was only moderately good, and in 12 cases, poor. In 6 other cases there were slight disturbances. The method he considers an improvement and suitable for all types of operations which can be performed rapidly. W. A. BRENNAN.

**Aloi, V.: The Mechanism of the Action of Chloroform** (Sul meccanismo d'azione del chloroformo). *Riforma med.*, 1918, xxxiv, 890.

Clinical experiments have led Aloi to conclude that chloroform anæsthesia causes in man an increased elimination of urea, nitrogen, and ammonia. After two or three days the nitrogenous output tends to become normal. Protracted chloroform anæsthesia causes the appearance in the urine of sugar,  $\beta$ -oxybutyric acid, di-acetic acid, acetone, and often albumin. Aloi has been able to demonstrate the presence of  $\beta$ -oxybutyric acid in the urine directly. Chloroform causes fatty degeneration in the organs and very probably acidosis, but further work is necessary to throw light on these points.

W. A. BRENNAN.

## SURGICAL INSTRUMENTS AND APPARATUS

**Osgood, R. B.: Bone and Joint Casualties and the Transport Splints.** *Pennsylvania M. J.*, 1919, xxii, 205.

In any serious injury of the bones and joints, shock and infection play a most important part, and

since trauma materially affects both, it is the first duty of the surgeon to lessen trauma by every possible means. Proper splinting materially decreases it and is therefore most important.

The first essential in good splinting for transport the author believes is the comfort of the wounded man. If the splint gives him ease from his wound-pain and does not add other discomfort, it meets the first requisite.

The splints must also fulfil the mechanical purposes for which they are applied.

The design of the splints must be simple and they must be light in weight in order that they may be manufactured in large quantities and easily transported.

For fractures of the long bones and certain joint injuries it is extremely desirable that they embody the two principles of fixation and traction: fixation, to protect the injured structures and to retain proper alignment after alignment has been secured; traction, to bring about muscular relaxation with the object of diminishing pain by inhibiting involuntary contraction which results in malposition. Traction also assures proper alignment by a pull in the direction of a normal anatomical line. It is in itself a method of immobilization and prevents the displacement of the bone fragments and the consequent laceration of the nerve, muscular, and vascular tissue.

To be practical for transport, the tracture must be integral. That is, it must obtain its tension by having one end of the splint placed against a fixed point from which it cannot slip, e.g., the groin or axilla, while the counter-point to which the extension bands are fastened is the notched end of the splint itself.

Ideally the transport splint should be a sufficiently accurate mechanical device to be used as a permanent splint and to be relied upon to bring about a satisfactory end-result when other and more complicated methods are not available.

H. J. VAN DEN BERG.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Schnoor, E. W.: The Hypophysis and Hypophyseal Disease.** *J. Michigan M. Soc.*, 1919, xviii, 87.

Our knowledge concerning the pathology of the hypophysis is limited practically to neoplasms. Munzer classifies the pathologic processes as follows: (1) atrophic conditions, (2) hypertrophic and hyperplastic conditions, and (3) tumors.

Tumors may excavate the sella turcica, open the sphenoid sinus and discharge cerebrospinal fluid from the nose. Moreover they may infiltrate the surrounding brain tissue or, as they increase in size, compress adjacent parts. As a rule the malignancy of pituitary tumors is relatively low and their tendency to metastasize very slight. Specific

hypophyseal symptoms, symptoms due to disturbances of the internal secretion, may occur alone or in combination with symptoms which are due to enlargement of the gland and alter the intracranial relations.

Among the conditions supposed to be related to the pituitary gland are acromegaly—hyperpituitarism, gigantism, leontiasis ossea, and Fröhlich's syndrome—hypopituitarism, adiposis dolorosa, and diabetes insipidus.

The treatment of pituitary lesions lies chiefly in the realm of surgery. Cushing has treated some patients with the glandular extract and has observed notable improvement, especially in cases of hypopituitarism. Recently Cauvin reported a case of acromegaly due to a neoplasm of the hypophysis



in which there were marked visual disturbances. This patient, when treated with the extract and the X-ray, had marked improvement of vision and was relieved of the intracranial pressure. There was no improvement, however, in the acromegaly and amenorrhœa.

Indications for operative procedure differ somewhat with the surgeon. Cushing and Hochenegg have operated in a few cases of active acromegaly with some beneficial result, but in Cushing's case the improvement was only temporary. In von Eiselsberg's opinion simple acromegalic or dystrophic adiposo genitalis without increased intracranial pressure or visual disturbances is not an indication for operation. Neither are cases in which minor visual disturbances are found on frequent observation by an oculist to be stationary or cases of irreparable ocular conditions without headache or with mild headache which yields to narcotics.

There are two modes of approach to the hypophysis, the intracranial route and the extracranial or transsphenoidal route. Operations on the hypophysis are extremely difficult and dangerous, the gland being quite inaccessible, the possibility of infection great, especially if the transsphenoidal route is employed, and brain trauma liable if the intracranial route is used. The surgical procedure varies with conditions which are indicated by symptoms, signs, and X-ray findings. The intracranial route is especially useful in cases of neoplasms which extend into the brain as it affords a much better view than the transsphenoidal route.

In the transsphenoidal route several modes of approach are in use: (1) The infranasal route; (2) the supranasal route; (3) the oronasal route; and (4) the endonasal route.

Kanavel has recently employed a different method, a U-shaped incision being made through the nasolabial margin of the face, the nose turned up, and entrance gained into the inferior part of the nasal cavity. The septum is partially removed submucosally, the interfering attachment of the perpendicular plate of the ethmoid and vomer bitten away, and the sphenoid cells and sella opened. The attachment of the vomer to the sphenoid is used as a guide to the median line. Careful X-ray study always precedes the operation.

Halstead makes the initial incision in the mucosa beneath the upper lip and then proceeds through the nose according to Kanavel's method. Cushing has adopted the Halstead-Kanavel route. In some cases in which difficulty was encountered in administering the anæsthetic Halstead and Cushing have performed a preliminary tracheotomy.

Von Eiselsberg has operated on 16 patients, 3 males and 13 females, whose ages ranged from 18 to 52 years. Eight cases were of the Fröhlich type, 6 acromegaly, and 2, a combination of both. Four patients died from meningitis. Beneficial results are not reported.

Hirsch has operated on 26 patients, with 3

deaths, a mortality of 11.5 per cent. Kanavel's method has been employed in 32 cases with a mortality of 37 per cent, and Schloffer's method in 45 cases, with a mortality of 37.8 per cent. Cushing has used the transsphenoidal route 29 times. Four patients died, a mortality of 12.7 per cent.

Cushing states that the results of surgical intervention in most cases of disease of the hypophysis consist only in the relief of regional symptoms and palliation of the increased intracranial pressure.

G. W. HOCHREIN.

**Dandy, W. E.: Ventriculography Following the Injection of Air into the Cerebral Ventricles.**  
*Am. J. Roentgenol.*, 1919, vi, 26.

Experiments were made first in injecting into the lateral ventricles of dogs various solutions which are opaque to the X-ray. These always ended fatally. The use of air to demonstrate the ventricles was suggested by the clear outline given by gas-filled intestines overlying bone, and the air-filled sinuses of the head.

To obtain the roentgenogram it is necessary to remove at least more cerebrospinal fluid than the contents of one ventricle and replace it with an equal amount of air.

Before the fontanels close the ventricular puncture is made through the interosseous defect; later it is necessary to make a small opening in the bone.

Air and water in a ventricle behave exactly as they would in a closed flask. Following any change in position, the fluid gravitates to the most dependent part and the air rises to the top. Owing to the free communication through the foramen of Monro, fluid and air will readily pass from one ventricle to the other. For practical purposes, enough fluid can be removed through one correct puncture from the anterior part of either ventricle.

The head should be placed face downward and partly rotated so that the ventricle to be aspirated is beneath and the needle enters at the most dependent point possible. The exchange of air for fluid must be made accurately. If the air injected is greater in volume than the fluid withdrawn, acute pressure symptoms will result. To obtain accuracy a record syringe with a 2-way attachment is used. A small quantity (20 cc.) is aspirated and an equal amount of air injected. This is repeated until all the fluid is removed. Roentgenograms ("ventriculograms") are made in the lateral and vertical positions (occiput to the plate).

At least twenty injections have been made, the amounts of air injected varying from 40 to 300 cc., the larger quantities in cases of internal hydrocephalus. Only once has there been any reaction, and in this case the injection (300 cc.) was made after the first stage of an operation for cerebellar tumor. The reaction, which consisted of a rise in temperature, nausea, vomiting and increased headache, was relieved after the release of the air by lumbar puncture. Ten days later a large cerebellar tumor was removed. The patient recovered.



The patients were all children whose ages varied from 6 months to 12 years. Invariably the lateral ventricle was sharply outlined in the roentgenogram. In two instances the third ventricle and the foramen of Munro were visible.

Practical value is expected from the injections principally from the shadows of the lateral ventricles. The air shadow diminishes day by day and finally disappears, acting in no way differently from the air included in every intracranial operation.

The author summarizes as follows:

The outlines of the lateral cerebral ventricles can be sharply outlined by the roentgen ray if air is substituted for cerebrospinal fluid.

The injection of air into the ventricles had no deleterious effect in 20 cases.

Ventriculography has already been proved to be most useful in the diagnosis of many intracranial conditions. In cases of internal hydrocephalus it is invaluable.

D. R. BOWEN.

**Glénard, R., and Aimard, J.: Traumatic Aerocele of the Brain** (Aérocèle traumatique du cerveau). *Presse méd.*, 1919, xvii, 123.

A soldier received a bullet wound in the head, the orifice of entry in the forehead being small and to the left and the orifice of exit being large, about 7 cm., and situated in the left temporal fossa.

There were three stages in the evolution of the injury. In the first stage there was a small flow of cerebrospinal fluid through the temporal orifice. After this wound had become definitely cicatrized the flow continued through the left nostril. A radiograph taken at this time showed a large clear space resembling an air pocket in the interior of the left frontal lobe. The loss of cerebral substance had created a cavity which was filled with air through its communication with the frontal sinuses.

The second stage in the evolution occurred after the nasal flow had lasted a month and consisted of the formation of a hydropneumatocele. This was followed soon by the third stage, the formation of an intracranial hydrocele.

The man died of pulmonary influenza. Autopsy confirmed the radiologic findings in every way. In the region of the third left frontal convolution and extending down to the second was a cavity of 25 cc. capacity filled with yellow fluid and closed externally by strong adhesions.

The condition gave rise to no particular clinical symptoms and the patient's mind did not seem to be affected.

This case, according to the author, shows once again that the disturbances suffered by those upon whom it is necessary to perform a trephination are not always in proportion to the extent of the cerebral lesions. It was very astonishing, however, that in this instance the presence of air, water, or both in a space 25 cc. in capacity in the interior of the frontal lobe did not cause any appreciable change in the patient's physical or mental functions.

W. A. BRENNAN.

**Lébédinsky, J., and Virenque, M.: Cranial, Maxillary, and Facial Prosthesis and Surgery** (*Prothèse et chirurgie crânio-maxillo-faciale*). Paris; J. B. Ballière et Fils, 1918.

This volume records the methods and results of handling war injuries of the cranium, face, and jaws at the center for maxillofacial surgery at Le Mans, of which Delagenière is the director, Lébédinsky, the chief of the prosthetic service, and Virenque, a surgical assistant. In the preface Delagenière points out the absolute necessity of collaboration between the surgeon and the dental prosthetist in order to obtain the best results in these cases. Delagenière is the originator of the method of osteoperiosteal grafting so successfully employed by the authors in the treatment of losses of substance of the cranium, large bone cavities in the femur and tibia, ununited fractures with loss of substance of the bones of the limbs and lower jaw, and repair of the bony skeleton of the face.

The general principles of treatment governing the authors in their work are the intimate association of the surgical and prosthetic departments and the practice of successive and gradual interventions in cases of great destruction, which is the only method of obtaining a good permanent result. If facial lesions are allowed to heal spontaneously grave vital complications rarely arise. Secondary hæmorrhages, pulmonary complications, extensive or diffuse infections are the exception. On the other hand, under these conditions hideous facial deformities sometimes result. The treatment therefore should have a double object, cosmetic and functional.

Normal healing should be aided by the different plastic methods. Adhesions, cicatricial retractions, bone union in bad position are to be avoided. Above all, bone continuity at the site of maxillary or facial loss of substance should be re-established. The treatment should be progressive, proceeding by stages, in order to avoid infections or other complications which are always to be feared from too rapid treatment.

In surgical restoration, the destroyed parts may be reconstructed by the classical French, Indian or Italian methods, though the authors rarely employ the latter. Often by making use of retracted flaps, of islets of healthy skin, or by simple undermining of cutaneous borders, apparently considerable losses of substance may be restored if care is taken to do the work progressively in stages. If borrowed flaps are required, the authors employ, when possible, frontal flaps. The frontal region is a valuable source of supply for the repair of all the extensive integumentary losses of the upper and middle portions of the face. For the reconstruction of skeletal lesions, osteoperiosteal, bone, cartilage or fat grafts are employed. Cartilage and fat grafts are of use only as an aid in obtaining a cosmetic result. While they have considerable value in the treatment of lesions of the upper and middle portions of the face, they are not indicated in cases of mutilation of the lower jaw in which osteoperiosteal grafts give the best results.



Facial reconstruction is considerably complicated by the fact that the fractured or destroyed regions are in communication with septic buccal or sinus cavities. In cases of extensive facial destruction, the extrabuccal portion should be reconstructed by osteoperiosteal grafts and the intrabuccal portion by prosthetic apparatus. Bone reconstruction of the extrabuccal portion allows the firm application of the intrabuccal piece, and thus the entire lesion is admirably repaired from both functional and cosmetic points of view.

The authors have completely rejected the immediate prosthesis described by Claude Martin as it favors nonunion, especially when used in the lower jaw. The sole advantage of the method, i.e., prevention of deformities following large losses of substance, is gained just as well and without any danger by the application of successive pieces of apparatus, less voluminous, and inserted later.

In cases of fracture of the jaw, the prosthetic appliances serve first of all to reduce the fragments and then to immobilize them in good position. This reduction and immobilization must be perfect so that the articulation of the teeth is exact; only in this way will normal mastication be possible. As soon as union is obtained, the appliances are removed. In other cases, prosthetic apparatus is permanently inserted to replace the destroyed intrabuccal portions of the jaw bones. Such is the complex rôle that prosthesis plays in the treatment of fractures of the jaws.

A common complication of facial lesions is constriction of the jaws. Attention is drawn to myopathic forms of this lesion, which are very frequently encountered and as a rule respond readily to mechanotherapy with Lébédinsky's dilating apparatus. Cases requiring operation are exceptional.

In the study of bone lesions, the treatment of loss of substance of the cranium is first considered. For almost three years the writers have employed osteoperiosteal grafts in cranioplasty. The technique is simple while the results are excellent and more satisfactory than those given by any other method.

Fractures of the lower jaw hold a principal place in the book. In the great majority of cases complete and permanent cures are obtained by prosthetic methods. The treatment is much more complex, however, in cases of ununited fracture with loss of substance. In these, the extrabuccal portion of the mandible, i.e., the inferior border and lower portion of the body of the bone, has to be reconstructed by osteoperiosteal grafts to re-establish its continuity. The intrabuccal portion should be replaced by a permanent prosthetic piece. It is needless to ask in this connection whether union in bad position is preferable to nonunion or vice versa. This question should not arise. What should be obtained in nearly all cases is a union in good occlusion, and this is possible with the authors' method of treatment.

The treatment of lesions of the upper jaw and of the face in general should not be studied separately.

The bone destruction in the great majority of cases extends from the maxillary region to the malar, zygomatic, frontal, and palatal regions. But here also the same principles hold as for lesions of the lower jaw. The intrabuccal portion requires primarily prosthetic treatment, while the injury to the upper and external region is repaired by surgical methods.

One phase only of the large subject of rhinoplasty is considered in the book, i.e., lesions of the middle portion of the external nose.

Secondary lesions of vessels of the head and neck are discussed at some length, and separate chapters are given also to lesions of the cranial nerves and the salivary glands. A final chapter is devoted to the general principles of the treatment of wounds of the soft tissues of the face.

From a surgical point of view, the most interesting feature of the book is the method of osteoperiosteal grafting for cranial and mandibular defects first described by Delagenière in May, 1916, before the Paris Surgical Society. The grafts are always taken from the internal surface of the tibia. In cranioplasty the choice of the side from which to take the graft is sometimes important because the patient may present sensory or motor disturbances of the lower limb on the side opposite the cerebral lesion which, from a psychic viewpoint and to avoid all future discussion as to the functional nature of the trouble, render it preferable to take the graft from the sound side. The operation of cranioplasty by osteoperiosteal grafts consists of three stages: (1) preparation of the cranial defect; (2) removal of the grafts; and (3) the placing and fixation of the graft.

First stage: Most commonly encountered is the case in which the loss of substance is of moderate extent, the scalp wound is healed, and there is no cerebral hernia at the time of operation. A crucial incision is made over the defect, the scar tissue removed, and the four flaps of scalp are turned back. Delicate dissection is necessary to avoid injury to cerebral substance which may be adherent. In approaching the base of the flap care must be taken to raise only the scalp and not to disturb the underlying pericranial aponeurosis. Good hæmostasis is necessary. The four liberated flaps are then held apart, thoroughly exposing the region of the loss of substance. The dura is rarely found intact; usually it is partially or even totally destroyed. With the point of a knife or the sharp edge of a periosteal elevator the border of the area of loss of substance is very exactly outlined, the line running 1 or 2 mm. outside the edge of the bone. This incision should pass down as far as the external table of the skull. With the periosteal elevator in close contact with the outer table of the bone, the pericranial aponeurosis and external periosteum are raised for about a centimeter all around the area in which the loss of substance has occurred. The osteoperiosteal grafts will be slid and fixed under the pericranium. Nothing then remains but the freeing of the edge of the bone orifice from the fibrous adhesions.



Second stage: Removal of the grafts. A vertical incision averaging 10 cm. in length is made down the antero-internal surface of the tibia. The skin edges are freed, care being taken not to injure the underlying tibial periosteum. The graft is obtained primarily from the upper portion of the tibia, and then if need be, from the middle portion. The higher the point selected the thicker and more vascular the periosteum and the wider the graft can be made. When the width of the tibia does not permit cutting a graft sufficiently wide to fill the cranial defect, a graft double the length desired may be taken, cut in two, and the two pieces placed side by side. The instruments required for removal of the graft are a knife, a thin chisel 1 cm. wide, and a mallet. With the point of the knife, the limits of the graft to be removed are traced on the periosteum. The length of the graft should exceed the size of the defect to be filled by at least 0.5 cm. at each end. With the chisel held vertically, the line traced by the knife is gone over, the bone being penetrated sufficiently to give the desired thickness to the graft which is thus outlined in all its dimensions. In order to free the deep surface, the chisel is held very obliquely, almost horizontally, with the bevel turned toward the bone to give the graft a uniform thickness. By proceeding slowly and regularly with gentle blows of the mallet, the bone plate is detached progressively and curls up like a wood shaving. The upper, lower, outer, and inner portions are freed successively, the middle being freed last. In this way a graft as regular and as uniform as possible is made. Its outer surface is smooth and uniformly covered with periosteum. The deep surface, formed of compact bone, is slightly irregular. Care must be taken not to detach the periosteum along the edges. On account of the thinness of their compact tissue, the grafts are not rigid and may be bent in any desired direction. As soon as the graft is cut it is transferred to the operative wound. It should be handled as little as possible, and put in the place intended for it at once.

Third stage: The placing of the graft and suture of the wound. The grafts are placed in the defect with the periosteal surface in contact with the dura or brain surface, and are fixed in position by forcing them obliquely or slightly exaggerating their curvature and sliding their ends under the fibroperiosteal flap. No suture is necessary for this fixation, which is doubly assured by suture of the four cutaneous flaps. The scalp is then closed very exactly, and two small subcutaneous drains are left in place for forty-eight hours.

The technique of the osteoperiosteal method in the treatment of ununited fracture of the mandible consists of the same three stages.

First stage: Preparation of the site of nonunion. The skin is incised horizontally 1 or 2 cm. below the lower border of the mandible. When possible, the incision is made in the line of previously existing scars. The skin edges being liberated, the sub-maxillary gland is freed from its adhesions and

carefully drawn aside. The facial artery must frequently be ligated. Above all it is important to obtain good exposure. Penetrating more deeply, the ends of the bone are exposed and freshened, and the interosseous space cleared. This stage is carried out carefully and methodically in order to avoid penetrating into the buccal cavity. Around the end of each fragment a pocket about  $1\frac{1}{2}$  cm. in depth is made between the bone and the fibroperiosteal tissue. The ends of the bone are freshened with the curette or rongeur and the interfragmentary space is then cleared of fibrous tissue with the knife, especial care being taken at its upper portion not to perforate the mucosa. It is necessary to prepare as large a bone surface as possible for contact with the grafts.

Second stage: Removal of the grafts, which is done as in cranioplasty.

Third stage: Placing and fixation of the grafts. The grafts removed from the tibia are usually three in number. One thin piece is slid on the inner surface of the fragments, its bony surface in contact with the bone. A second transplant of the same thickness is applied in the same way to the external surface and bent around the lower border of the mandible into contact with the first transplant. Finally, a thicker graft is wedged into the space between the fragments. This method of procedure assures close contact between the grafts and the bone extremities, and prevents dead space between the grafts. The extent and site of the nonunion may lead to slight modifications in the technique.

As a rule, the bone fragments being well immobilized, no fixation is necessary other than hermetically closing the space in which the transplants are situated. The deep cellular plane is sutured carefully with catgut. The graft thus cannot move and is well protected. Good hæmostasis in the wound is advisable. When this is obtained, the skin can be sutured without drainage.

In the opinion of the authors, osteoperiosteal grafts give results impossible to achieve by any other methods. It is the most rational method and based on the osteogenic function of the deeper portion of the periosteum and outer layer of bone. By the formation of a callus which fuses the two fractured extremities, it permits a complete and firm re-establishment of the continuity of the bone. By means of osteoperiosteal grafts, also, the bone tissue can be restored almost completely to its normal form, since the grafts may be given the desired shape easily.

The ordinary bone grafts give much less satisfactory results. It is well known that generally the compact tissue of the graft does not live. The grafts thus play an entirely mechanical rôle, and in this case in order to obtain a union reliance must be placed solely on the osteogenic activity of the ends of the fragments. The removal and placing of the bone graft are much more difficult than in the osteoperiosteal method and require special instruments.

The book is well illustrated throughout with



the histories of practical cases in which the authors' methods have been followed, and will be of great value as a work of reference for those engaged in the reconstruction of maxillofacial injury. R. H. IVY.

**Kazanjan, V. H.: Early Suturing of Wounds of the Face.** *J. Am. M. Ass.*, 1919, lxxii, 626.

The benefits of early suturing are that the healing process is shortened and unsightly scars are avoided. The time for suturing depends upon the location and severity of the wounds, the structures involved, and the degree of sepsis. Wounds connecting with the oral and nasal cavities are always re-infected. Injuries associated with comminution of bone do not do well, the wide excision of infected tissue being impracticable on the face.

Superficial wounds with no, or slight, loss of soft tissue, and lacerations of the margins of the lips and nose respond favorably to primary suture.

The avoidance of general anesthesia is of great importance in injuries about the mouth as oral sepsis frequently leads to bronchial pneumonia.

In the majority of cases secondary suture may be done between the fifth and twelfth days. Fixation of the bone fragments and control of sepsis should always precede the operation. Reconstruction of the face should be attempted only after all suppuration has subsided.

LISTER TUHOLSKÉ.

## NECK

**Serafini, J., and Uffreduzzi, O.: Total Peripheral Implantation of the Inferior Laryngeal Nerve into the Pneumogastric** (L'implantation périphérique totale du nerf laryngien inférieur sur le pneumo-gastrique). *Arch. de. méd. exper.*, 1919, xxviii, 209.

A number of experiments have been performed on dogs to verify the findings reported by Hoessly in 1916 regarding the possibility of anastomosing the sternocleidomastoid nerve with the peripheral trunk of the recurrent nerve.

After testing a number of operative methods the procedure finally decided upon was as follows: With the animal in the dorsal position, the head being strongly extended, a vertical incision about 8 cms. long was made in the median line at about the lower part of the cricoid cartilage. The muscles and trachea were then separated by blunt dissection and the recurrent nerve easily recognized in the angle between the trachea and œsophagus and fixed by passing a loop of thread beneath it. The sternohyoid, sternothyroid and sternocleidomastoid muscles were moved aside as well as the thick cellular tissue of the neck until the vasculonerve bundle consisting of the primary carotid and vagus was met. The recurrent nerve was sectioned near the thyroid, a part of the central trunk of the nerve resected, and a needle with fine No. 00 catgut passed through the distal stump. An assistant then lifted the vasculonerve bundle delicately between the fingers and a small incision was made in the posterior

internal segment of the vagus. The peripheral end of the recurrent nerve was then sutured into the sectioned zone of the pneumogastric nerve and the muscles and skin closed.

The animals have borne the operation well. Fourteen experiments have been carried out: 3 implantations of the right recurrent directly into the pneumogastric; 4 implantations of the right recurrent into the vagus with the aid of a nerve strip dissected from the vagus itself; 2 implantations of both recurrent nerves directly into the pneumogastric; 3 resections of a part of the right recurrent; 1 bilateral transplantation of the superior laryngeal into a strip dissected from the hypoglossal nerve and simultaneous bilateral implantation of the inferior laryngeal into the vagus.

From the examination of animals which died or were killed the authors found that when the experiment was considered good no macroscopic or histologic differences could be detected between the half of the larynx on the side of the implantation and the intact half. The mucosa and the musculature of the vocal cords were unchanged even after a long lapse of time. Examination of the site of implantation showed that there was continuity of the nerve fibers between the vagus trunk and the implanted recurrent nerve.

As regards the functional results, the three necessary requisites for successful nerve implantation are: (1) the clinical re-establishment of function in the region of a paralyzed nerve; (2) anatomical reunion of nerves; and (3) histologic proof of the passage of nerve fibers across the suture. All of these fundamental conditions were perfectly fulfilled in the experiments reported.

The authors believe that the operation may be considered harmless and useful and that it is applicable to man.

The results of this research were originally reported to the Royal Academy of Medicine of Turin in 1914 and priority is claimed by the authors for the method of anastomosing the recurrent nerves as Hoessly's researches were not published until 1916.

W. A. BRENNAN.

**Levin, S.: A Discussion of Goiters in 583 Registrants.** *J. Michigan M. Soc.*, 1919, xviii, 98.

Levin discusses the occurrence of goiter in 583 registrants examined in Division 2, Houghton County, Michigan. He studied and tabulated the results of the examinations made by himself and associated physicians of the men who appeared at the registration of June 5, August 24, and September 12, 1918. The ages of the registrants ranged from 18 to 21 and from 32 to 36 years. Goiter he defines as "any palpable enlargement of the thyroid gland."

It is the author's impression that the many cases of acute hyperthyroidism were due to the high tension produced in young men by the war and by their worrying and nerve-strained relatives which whipped up many quiescent goiters and also excited potential simple goiters to activity.



More men were disqualified for military service because of large and toxic goiters than any other condition. In the author's division, 20.9 per cent of the registrants had goiters sufficiently severe to disqualify them from active service. Of the 583 registrants, 30 per cent showed a demonstrable enlargement of the thyroid. Of these, 24 per cent were simple goiters, 3.9 per cent toxic, and 2.4 per cent large goiters of the adenomatous, colloid or cystic types.

In the author's opinion, the incidence of goiter in Michigan, and especially the upper peninsula, is about 50 per cent, this state being therefore a close second to Switzerland which has more goiters than any other country in the world. In investigating the places of birth of the registrants, he found that of 155 men of 21 years of age, all but 3 were born in the goiter belt. The decreased percentage of goiters in the older registrants was probably due, he believes, to the fact that a certain proportion of these registrants were born elsewhere and had traveled in non-goiterous districts.

The true percentage of goiters in men, judging from those examined, is probably 30.3 per cent. Women are twice as prone to thyroid enlargement.

On the basis of this study it would be found that in Houghton County, Michigan, there are 26,694 goiters, of which 5,550 are of a disqualifying type, and in the upper peninsula of Michigan there are 98,665 goiters, 20,515 of which are large and toxic. The economic and social importance of these figures cannot be denied. G. W. HOCHREIN.

**Bonn, H. K.: Malignant Epithelial Growths of the Thyroid Gland** *J. Indiana M. Ass.*, 1919, xii, 67.

Cures of cancer of the thyroid are very infrequent because the malignancy is not recognized sufficiently early or there were early metastases.

Metastases of thyroid carcinoma commonly revert to the normal type of thyroid tissue, and a malignant degeneration of the thyroid does not deprive the gland of its normal function. Reference is made to von Eiselsberg's classical case in which there were no evil results after a complete thyroidectomy for malignancy until postoperative metastases were removed, when myxœdema promptly occurred.

The author accepts Langerhans' classification of epitheliomata of the thyroid, which is as follows: Malignant adenoma or proliferating goiter, metastatic colloid goiter, papilloma, parastruma, post-branchial goiter, carcinoma, and cancrioid or squamous-cell carcinoma.

Malignant disease of the thyroid usually appears between the ages of 40 and 60 years and is much more frequent in females than in males.

The most common form is the subacute type in which the condition appears in a goiter which has been stationary for years. Apparently without cause, the growth begins to enlarge and change from a soft to a hard consistency. These two physical signs are sufficient to justify the suspicion of beginning malignancy. Later symptoms are

dyspnœa, dysphagia, rough voice, barking cough, and pain running to the chin and ear. Thyroid insufficiency is not frequent, either because the entire gland is not involved or because the malignant thyroid cells have not lost their physiologic properties. A. H. NOEHREN.

**Eddy, N. B.: The Rôle of the Thymus Gland in Exophthalmic Goiter.** *Canadian M. Ass. J.*, 1919, xi 203.

The author gives in detail the results of his experiments with rabbits to determine whether or not an excess of the product of thymus activity in the circulating blood may cause exophthalmic goiter. In these experiments he saw no evidence of the production of symptoms characteristic of the disease.

From a review of the literature on the subject, it seems evident that there is some connection between the thymus gland and exophthalmic goiter, but just what the nature of this relationship is has not yet been discovered. It is possible that the thymus acts independently of the thyroid in producing Basedow's disease when excited to hyperplasia and hypersecretion by external influences. It is also possible that because of a relationship between it and the thyroid, it becomes hyperactive as the result of the increased activity of the latter. On the other hand, the hyperplasia and hypersecretion of the thymus may be the result of an effort to render harmless the toxic products produced by the thyroid. Still another conception of the etiology of exophthalmic goiter which must not be overlooked is that suggested by Crile, i. e., that neither the thyroid nor the thymus is primarily at fault, but that the changes observed in these glands and the symptoms attributed to alteration in their function are due to the operation of some unknown factor. An array of facts can be marshalled in support of each of the hypotheses mentioned. H. J. VAN DEN BERG.

**Link, G.: Preliminary Thyroid Operations.** *J. Indiana M. Ass.*, 1919, xii, 64.

The author takes up the lesser operations for those cases of thyrotoxicosis in which thyroidectomy would endanger the patient's life because of the degree of thyrotoxic saturation or the inability of the excretory organs to carry off the toxins. The lesser operations seldom cure, but may bring about sufficient improvement to make thyroidectomy safe. When there is a possibility of fatal issue, surgeons should not depend too much on their mastery of surgical technique but should be satisfied first with a preliminary operation.

The procedures enumerated are injections of boiling water, ligation of the thyroid vessels, and ligation of the thyroid pole. If the improvement from one operation is not sufficient, it should be repeated.

In injecting boiling water, the writer first makes a small incision, uncovers the gland and then injects into its various parts.

In ligating the thyroid vessels, the superior and inferior thyroid arteries of one side may be ligated



through one incision, though ligation of the inferior thyroid artery alone is the preliminary operation of choice. Ligation of both sides at the same time is not safe, because of the greater operative shock and because the blood supply of the parathyroids does not have time to adapt itself as after ligation of one side at a time.

The technique of ligating the thyroid arteries is hard to learn from surgical and anatomic literature as the anatomy is seldom illustrated correctly.

The author concludes that a wider use of preliminary thyroid operations will extend the field of thyroid surgery and prevent many deaths from ill-timed thyroidectomy.

A. H. NOEHREN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Diemer, F. E.: Complications in Pneumonia.**

*Am. J. Roentgenol.*, 1919, vi, 86.

Brief descriptions are given of various complications of pneumonia as studied by the roentgen ray. Examination of the pleural effusion should be made with the patient erect as a small amount of free fluid in the pleural cavity may form a thin layer and be difficult to detect when the patient is recumbent.

Drainage of a large collection of fluid from the lower quadrant may be followed by the formation of adhesions and the encapsulation of fluid in the upper quadrant. Fluid may occupy the entire costophrenic sinus and compress the lung entirely from below upward. In other cases it may be located toward the front, toward the back, or toward the side, or may occupy the entire sinus, compressing the lung from three sides rather than from below.

The differential diagnosis may be difficult both from the plates and the fluoroscopic examination if the fluid is under pressure and the lung compressed so that little or no air enters it. When the effusion is extensive the heart may appear enormously increased in size and pericardial effusion may be suggested.

Encapsulated interlobar empyemata, often difficult to recognize, are found ordinarily between the right upper and middle lobes. They appear usually as fan shaped, or on stereoscopic examination, cone-shaped, areas with the apex toward the hilus. The greater part of the shadow is cast by the thickened interlobar pleura, the amount of fluid being usually small. The fluid is eventually absorbed or organized into fibrous tissue. In some cases it may rupture into the pleural cavity, producing general pleural effusion.

Emphysema along the course of the pulmonary vessels was observed in several instances. It is most marked along the surface vessels and apparently begins at the periphery and extends toward the hilus by dissection. In two cases eventual rupture of the visceral pleura produced a spontaneous pneumothorax.

The emphysema along the blood vessels presents an elongated area of increased radiability extending from the periphery almost to the hilus. It differs from a dilated bronchus because the borders are scalloped and there are no indications of fibrous infiltration as in bronchiectasis.

Lung abscesses are comparatively rare and must be differentiated from encapsulated effusion. In abscess, if the patient is examined in the erect position, a fluid level is observed which remains parallel with the floor when he is moved or bends over. This may occur also, but more rarely, in encapsulated effusion.

D. R. BOWEN.

**Stewart, W. H.: Streptococcus Empyema; a Study of the Condition as Revealed by the Roentgen Ray.** *Am. J. Roentgenol.*, 1919, vi, 57.

The unusual prevalence during 1917-18 of empyema due to *Streptococcus hæmolyticus* has done much to further our knowledge of diagnosis by the roentgen-ray in diseases of the chest. Stewart believes that accumulations of fluid in this affection occur in the same way as in empyema following pneumonia but form more rapidly.

Early effusions appear in the axillary space and climb up in the pleural cavity until the apex is reached. They are detected by the X-ray as a ribbon-like shadow in the outer zone of the chest with a sharp inner border. With the increase of fluid the shadow increases in width and extends to the diaphragm. In the early stages there is an area of clear lung between the shadow and the hilus. Not until the shadow reaches the outer edge of the inner zone does it tend to accumulate at the base. Finally the effusion extends upward in the inner zone, producing the characteristic cup-shaped upper border which continues until the effusion is nearly complete and the entire side is filled with a dense shadow. Only then is there a distinct displacement of the mediastinal contents to the opposite side. With thorough appreciation of these facts, there should be no difficulty in recognizing the presence or absence of fluid.

In this affection the pleural thickening and formation of adhesions are much more extensive than in other infections. Therefore the probability of sacculation is greater so that accurate localization is essential. This can be accomplished only by thorough fluoroscopic and stereoscopic examination confirmed by aspiration.

In a certain percentage of cases, even after the cavity is sterile, it becomes evident that permanent closure can be obtained only by further operative measures.

An important group of cases are those in which there was premature closure and a re-accumulation either in the old or in a new location, possibly in the



lung substance. The pleura is greatly thickened, sometimes measuring over an inch, and exact differentiation is often extremely difficult.

A number of patients after healing of the thoracotomy wound have a persistent pneumothorax within dense fibrous walls. Such cavities occasionally become filled with exudate the discovery of which is difficult because the densities of the fluid and the thickened pleura are so similar. Little more can be done than to call attention to the findings and to state the various possibilities. If repeated aspirations also fail, repeated X-ray examinations may clear up the uncertainty. Effusions tend to increase and pleural thickenings to decrease. Unless contra-indicated, there should be repeated examination by both fluoroscopic and radiographic methods. If the information is still insufficient, examination after injection of an opaque solution or paste is indicated.

Stewart has found bismuth pastes most satisfactory. The danger of poisoning is minimized by selecting a pure salt and one other than the subnitrate. Most reported cases of intoxication have been traced to the presence of nitrites. With proper asepsis, re-infection of a sterile cavity should be avoidable. The difficulty of removal can be overcome in a measure by washing the cavity with warm oil. As the paste interferes with drainage as a rule only when it is injected in too large cavities, Stewart has discontinued its use in such cases.

A 20 per cent solution of the iodides gave very satisfactory shadows but proved to be too irritating. Most generally used was a 15 per cent solution of thorium nitrate. This is expensive but is readily washed out and does not interfere with subsequent drainage or the continuance of Carrel-Dakin treatment. Injection into large cavities is to be avoided if possible. Later, at the suggestion of Lieut. Stevens, a suspension of 20 per cent bismuth subcarbonate in oil or liquid albolene was used in place of the thorium which was difficult to obtain.

All cases in which any preparation of bismuth is injected should have free drainage and care should be taken to remove as much of the injected material as possible.

D. R. BOWEN.

**Keilty, R. A.: Empyema, Its Pathology in Relation to Roentgen-Ray Examinations.** *Am. J. Roentgenol.*, 1919, vi, 70.

The statement has been made that the cases of empyema which developed during the past winter's epidemic (1917-18) were of a different type from those seen before. In an experience of more than a year in the United States General Hospital No. 14, however, Keilty has found no variance whatsoever. The erroneous belief he ascribes to the fact that when the number of cases increased, interest centered around them and conditions which ordinarily would have been lost sight of were given undue importance.

That the terms "empyema," "pleurisy," and "pleuritis" are not definitely established in the minds of most clinicians, is one of the major reasons

for the variance in opinion. "Pleurisy" is a poor synonym for "pleuritis" which is a better term. Empyema of the pleural cavity is a pleuritis but a pleuritis is not necessarily an empyema. The term "empyema" should be restricted to those cases which have a definite localized and walled-off collection of pus in the pleural cavity. The term "pleuritis" includes all types of inflammatory processes of the pleural cavity, acute or chronic. Acute pleuritis is subdivided into fibrinous, serofibrinous, and purulent. Empyema is a type of the latter. There may be accumulations within the chest of several different types of fluids which are not empyematous. If these facts are borne in mind, much confusion will be avoided.

When empyema complicates lobar pneumonia, the expansion of the lung from the exudate within forces it against the side of the chest where it is held by the plastering and sticky character of the exudate. This mechanical force influences to a great extent the position of the developing empyema. When the patient is recumbent, there are two levels of fluid collection in the presence of fibrinous exudate, i. e., anterior and posterior. The posterior collections are always greater than the anterior collections and more likely to be in one large area. Interlobar collections may occur at any position and are again very often dependent upon the plastering of the exudate. In Keilty's experience these interlobar collections are uncommon and of small amount. He believes that when the diagnosis is made on clinical examination and from X-ray plates frequently, there is some mistake in the interpretation of an interlobar condition.

In the bronchopneumonias the increase in the size of the lung is less and the collections are more definitely posterior or lateral. The fluid pressure is then felt against the lung which is likely to be pressed against the median line.

Keilty advises more frequent roentgen examinations in pleuritis as on several occasions he has seen reports of roentgen examinations which were made several days prior to death and which therefore did not agree with the postmortem findings, not because of faulty interpretation of the roentgen pictures but because of changes which had taken place in the condition.

Examinations made of a large number of cases every three days for a period of five weeks, or from the beginning of the signs of pleuritis to the definite walling off of an empyema, would be most instructive.

D. R. BOWEN.

**Savage, F. J.: The Treatment of Empyema.** *Minnesota Med.*, 1919, ii, 95.

The Brewer tube, connected with a negative pressure apparatus and used early in the disease, gives good drainage and at the same time prevents extreme collapse of the lung and displacement of the heart. Resection may be done later, but in the meantime a sufficient number of pleural adhesions are formed to prevent extreme collapse of the lung,



and the mediastinum is sufficiently anchored by adhesions to prevent any marked displacement of the heart.

When the pus is not localized, resection of 4 cm. of the eighth rib, beginning at the angle and extending outward, seems to be the most satisfactory operation. This permits the use of the Carrel-Dakin method of treatment and gives dependent drainage during convalescence. Localized pockets should be opened as indicated in each case. The earlier an empyema cavity is rendered sterile, the less fibrous tissue there will be to keep the lung contracted, the earlier the opening may be closed surgically or allowed to granulate in, the quicker the lung will re-expand, and the less the probability of pocket formation.

E. B. FREILICH.

### TRACHEA AND LUNGS

**Jackson, C.: Dental Broach in the Bronchus; Report of a Case.** *Dental Cosmos*, 1919, lxi, 201.

The writers report the seventh case in their experience of aspiration of a dental broach into the bronchi. The short shank and milled handle of a dental broach causes it to slip easily from the fingers. When swallowed, as has occurred in many instances and without any resulting harm, there is always the danger of perforation of the intestinal wall. To prevent swallowing or aspiration of the broach teachers of dentistry advise the use of a rubber dam to wall off the throat and mouth cavities.

When aspirated, the dental broach often reaches the smaller divisions of the bronchi because of its small size. In such cases it is difficult to remove it. In most instances it has been found with the point up and there was little probability that it would be coughed out as the point tended to catch in the walls of the bronchi or lodge in the narrow laryngeal orifice.

In the case reported the patient was a woman, 45 years of age. The broach was removed under local anæsthesia by bronchoscopy on the ninth day following the accident in ten minutes and 1 second and without any resulting reaction. The fact that in this case there was only a slight disturbance following the aspiration of the broach emphasizes the importance of early roentgenographic localization. If the foreign body which has disappeared down the pharynx is lodged in the œsophagus or bronchus, it may then be removed before it does any harm, while if it has entered the lower alimentary tract, its progress may be watched so that preparations may be made to remove it by laparotomy if perforation is threatened.

H. H. FREILICH.

**Corlette, C. E.: An Improved Operation for Large Hydatid Cyst of the Lung.** *Med. J. Australia*, 1919, i, 168.

The semi-prone position, with the side to be opened at the edge of the table and downward, is recommended by the author in operations for hydatid

cyst of the lung and empyemata. In cases of hydatid cyst, when drowning is a real peril, this position manifestly diminishes the risk of flooding the bronchial system of the sound lung, while at the same time the force of gravity and the downward and outward rush of water brings the parasitic cyst-wall out into the wound, greatly facilitating its extraction.

As regards the method of entering the thorax, an incision not quite along the line of a rib, but approximately transverse, is suitable for cases in which it is probable that portions of more than one rib must be removed. In addition, the author's method of splitting the latissimus dorsi in the direction of its fibers, instead of cutting across it, lends itself particularly well to a thoracotomy which is to be closed immediately by layered suture, pleura to pleura, muscle to muscle, and skin to skin.

The most satisfactory and distinctive part of the operation is the treatment of the sac after evacuation, not by the insertion of a drainage tube, as is the usual practice, but by immediate closure. The writer reports a case in which immediate closure following evacuation of the cyst gave good results.

H. H. FREILICH.

**Lilienthal, H., Brickner, W. M., and Kellogg, W. A.: Thoracic Injuries; Report of Cases Treated by Surgical Team 39 at Evacuation Hospital No. 8 from Sept. 6 to Oct. 25, 1918.** *J. Am. M. Ass.*, 1919, lxxi, 839.

Of a total of 67 cases of thoracic injuries treated by the authors, 16 (23.8 per cent) were fatal. Of 51 patients operated upon 14 (27.4 per cent) died, while of 16 patients upon whom no operation was performed only 6.2 per cent died.

The wounds seen in evacuation hospitals may be divided into two classes: (a) those which demand repair of obvious injuries to the chest wall, such as large open wounds or extensive fractures of ribs with probable injury to the lungs, and (b) those in which there are injuries to the lung or large foreign bodies in the thorax which demand exploration.

The wounds of the first class should be treated according to ordinary surgical principles and closed as well as possible. When there are large defects in the pleura, the opening should be stopped by suturing in the inflated lung as a plug if there is not sufficient other tissue for the purpose.

The wounds of the second class should be operated upon by what has been called major intercostal thoracotomy without resection of the ribs. With the aid of a well constructed rib retractor, an ample opening can be made through which all parts may be clearly inspected and operations on the lungs, diaphragm, and most portions of the chest wall can be performed with ease. In concluding the operation, the ribs may be easily brought together and the pleura fully approximated by three pericostal sutures of absorbable material. Whether or not there should be approximation of the skin, is a matter to be decided in each case.

Wounds may present the character of both of the



classes described. In such cases the principle of visual exploration with the aid of a rib spreader should be followed.

Some kind of forced anæsthesia, such as the intrapharyngeal method, is absolutely necessary for the full exploration of recent wounds of the thorax.

All thoracic wounds should be under observation at the evacuation hospital for not less than ten days and even then it is possible that complications, mechanical or due to infection, may occur later.

Pneumonia of the opposite lung is the greatest immediate danger in these cases. While its cause is unknown, the patient should be guarded against cold and exposure, especially during the change of dressings.

E. B. FREILICH.

### PHARYNX AND OESOPHAGUS

**Huntington, J. L., Young, J. H., and Foot, N. C.:** Report of a Case of Congenital Atresia of the Oesophagus. *Boston M. & S. J.*, 1919, lxxx, 354.

Huntington, Young, and Foot report a case of congenital atresia of the oesophagus in which the condition was demonstrated at autopsy.

The patient, a female child, was born at term, with normal delivery. Though it breathed at once, it seemed to be secreting a great deal of mucus and required constant attention for the first two hours because of repeated attacks of cyanosis and choking. Whenever there was respiratory difficulty, the evacuation of a dram or two of thick, tenacious, slightly yellow mucus by the mouth would give temporary relief.

The patient was six hours old when first seen by the surgeon. At first examination nothing unusual was suspected as, except for the large amount of mucus in the throat, it appeared normal. When seen the next day, the amount of mucus was considerable and the attacks of choking and cyanosis frequent. The child had had normal meconium movements and had passed urine. When given water from a medicine dropper and when put to the breast, it would take a mouthful, choke, and stop breathing. When finally an attempt was made to give a tube feeding, the tube met with an obstruction 5 inches below the gums. Beyond this no fluid would pass. Although the tube caused no discomfort, respiration ceased when the attempt was made to pour in fluid. Complete obstruction of the oesophagus was evident. Surgical treatment was not justifiable because of the poor physical condition of the patient who died on the fourth day, death being due to exhaustion and an inhalation pneumonia.

At autopsy it was found that, beginning at the pharynx, the oesophagus extended downward to a point 3.5 cm. below the glottis, where it terminated abruptly in a rounded, slightly tapering, blind extremity not unlike the thumb of a glove. This was 1.5 cm. in diameter, with thickened walls 2 mm. in diameter, and contained a good deal of thick, tenacious mucus. From its extremity, a small musculofibrous cord continued to a lower oesophageal

segment 2.5 cm. further down. The cord measured 1 mm. in thickness. The lower segment of the oesophagus opened out of the trachea, just at its point of bifurcation. In its general structure and size it appeared to be similar to a normal oesophagus, being 1 cm. in diameter, and having walls of normal thickness and color. It terminated normally in the cardiac end of the stomach. The opening into the trachea was a small, transverse slit, about 5 mm. in width, communicating with the posterior surface of the trachea at a point directly behind the bifurcation. For 1.5 cm. above this communication there was a suggestion of funnel-shaped bulging of the posterior tracheal wall.

Microscopic examination of cross sections of the connecting cord taken at different levels showed no trace of epithelial tissue, it being made up of longitudinally arranged muscle fibres and intermuscular connective tissue. The muscle was striated.

There are several theories to explain the anomaly. The most probable is that it was due to pressure during the development of the oesophagus. At an early period, the walls of the foregut grow toward one another to form two folds. In front of these folds is the future trachea and behind them the future oesophagus. If, during this phase of development, pressure is exerted at a point near the bifurcation of the respiratory tract by the impinging processes of body-cavity, the fusion will take place along new lines at this point. As a result there will be a shunting-out of the lower two-thirds of the oesophagus from the foregut into the respiratory tract and an obliteration of the lower extremity of the upper third of the oesophagus, with the formation of an upper blind segment or cul-de-sac communication with the mouth. It is easily seen how such an anomaly, with the presence of numerous mucous glands in the pharynx and upper cul-de-sac actively secreting, and in the cul-de-sac, possibly hypertrophied, would cause the collection of much mucus in the mouth and upper air passages. This could not be swallowed and if inhaled might excite further secretion in the trachea and bronchi from the resulting irritation and thus establish a vicious circle.

G. W. HOCHREIN.

### MISCELLANEOUS

**Le Fort, R.:** One Hundred Extractions of Projectiles From the Mediastinum or Its Immediate Neighborhood (100 cas d'extractions de projectiles inclus dans le mediastin ou son voisinage immediat). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 195.

Le Fort's hundred operations were done on 97 patients for the extraction of 106 projectiles. From 1916 to 1918 the number of successful extractions improved from 77.1 to 100 per cent, the last 21 operations in 1918 all being successful. This latter percentage was due principally to the adoption of the transpleural route with extensive resection of one rib and simple section of the cartilages.

The conclusions drawn from these cases are:

1. All valuable technical methods should be used before and during the operation, especially radiography.
2. The operation should be performed in full daylight or under the screen with the assistance of an experienced radiologist or under intermittent control of the screen.

3. Except in unusual cases the wide anterior transpleural route should be used.

4. The operation should be performed in a well heated room, and after operation the patient should be kept absolutely quiet in a moist, warm atmosphere.

5. The wound should not be drained.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Frank, L.: Sliding Hernia; With Report of Two Cases Involving the Urinary Bladder.** *Am. J. Surg.*, 1919, xxxiii, 49.

A comprehensive discussion of sliding hernia of the urinary bladder must necessarily include other types of sliding hernia because the pathology in all is practically identical. In less degree it must consider also herniæ in which a portion of the bladder occupies the true hernial sac, although the sliding process may form no part of the pathology. Few instances of sliding vesical hernia have been recorded.

In 4,285 herniotomies performed in one of the largest American hospitals, a portion of the bladder was found in the hernial sac in only 8 instances.

Vesical hernia, whether sliding or not, occurs with greater frequency in males than in females, the proportion being about 4 to 1.

By the term "sliding hernia" or the "hernia par glissement" of the French is meant a hernia in which a portion or all of some of the slightly mobile pelvic viscera slide downward through the opening into the hernial sac, with or without intestine or omentum, the sliding organ necessarily being incompletely enclosed by peritoneum.

Sliding herniæ involving any of the pelvic viscera are comparatively very uncommon. In a series of over 500 herniotomies mentioned by Kirschner in 1911 the hernia was said to be a sliding hernia in only 15 instances.

The most rare type of sliding hernia is that in which the bladder constitutes the sliding viscus. This condition is so infrequently observed that many authors doubt its existence and therefore ignore the subject entirely. Cooper in 1804 reported what was undoubtedly a sliding vesical hernia though it was unrecognized. His report, which is the first comprehensive description the author had been able to find in the literature, he quotes verbatim.

The comparative incidence of sliding vesical hernia cannot be even approximately estimated. In Kirschner's 15 cases of sliding hernia noted in a series of over 500 herniotomies the bladder is not mentioned as the sliding viscus. In the 8 cases of vesical protrusion in the 4,285 herniotomies cited, 350 cases of vesical hernia reported by Bruner, Curtis and others, and 192 cases collected by Cheesman, no mention is made of the sliding type.

During the last twelve months 3 cases of sliding hernia have come under the author's personal observation. In 2, the sliding viscus was the bladder. In the third, a small segment of the descending colon without peritoneal investment was found in the hernial sac. All of the patients were subjected to surgical treatment with satisfactory results.

No other cases of sliding vesical hernia have been seen in the author's surgical experience extending over a period of more than twenty-five years.

The details of the 2 cases in which the bladder was involved are reported and illustrations show the operative findings and the method of closure.

### GASTRO-INTESTINAL TRACT

**Moller, J. F.: Invagination of the Stomach (In vaginatio ventriculi).** *Hosp.-Tid.*, 1918, lxi, 1592.

In the case reported the patient, a woman aged 66 years, came to the hospital for treatment of a fractured femur. There was no history of gastro-intestinal trouble. Shortly afterward, however, diarrhœa with blood and mucus in the stools and continuous vomiting began. The abdomen was flacid and there was no tenderness below the umbilicus. In the epigastric region some distension was noted. The stools continued to show blood and were watery in consistency. Dyspnœa finally developed and the patient died.

At autopsy no signs of peritonitis were found. The intestines were collapsed and the stomach and upper duodenum were distended. In the descending colon were three small pedunculated tumors. The cause of death was found to be a polypoid tumor which had its origin in the anterior wall of the stomach and had penetrated into the duodenum, drawing the anterior stomach wall with it. The pedicle of the growth was 3 cms. thick but only 1 cm. long. Microscopically this tumor and those in the colon were adenomata.

Apparently the gastric tumor had caused no symptoms until it had become fixed in the duodenum, and its condition made it seem probable that the invagination of the stomach was an acute process which had begun only shortly before death.

The author found the reports of only two other cases in the literature. In both of these also the patients were elderly women but the condition was chronic.



Preoperative diagnosis is practically impossible; the condition is interpreted as cancer, ulcer, volvulus, high intestinal obstruction, or acute gastric dilatation. If the tumor or invaginated portion of the stomach is excised early recovery is probable.

W. A. BRENNAN.

**Rowe, O. W., and Coventry, W. A.: The Treatment of Hypertrophic Stenosis in Infancy.** *J. Lancet.*, 1919, xxxix, 137.

This article is a detailed account of 12 cases which came under the author's observation at the Duluth clinic during a seven months' service. All the patients were treated medically, and 5 were treated surgically. One patient died.

On the basis of his experience the author concludes that:

1. Medical treatment should be offered in all cases of congenital hypertrophic stenosis until it has been definitely determined that surgery is necessary.

2. The farina treatment described by Sauer is of distinct value in selected cases.

3. The symptoms which demand surgical intervention are rapid loss in weight, persistent forcible vomiting, and active gastric peristalsis.

4. The roentgen-ray and the duodenal catheter reveal nothing which is not easily discovered by simple physical examination, and are not without danger.

H. J. VAN DEN BERG.

**Meengs, J. E.: Organic and Functional Achylia Gastrica.** *J. Michigan M. Soc.*, 1919, xviii, 96.

Meengs calls attention to the importance of distinguishing between organic and functional achylia, because in the former the dietetic regime is governed by the condition of the mucous membrane of the stomach, while in the latter, a regular "Mastkur," the increasing of the amount of nourishment to the point of greatest assimilation and a general building up of the body and nervous system, is required.

Organic achylia in which there is more or less atrophy of the mucous membrane, is often caused by chronic gastritis or is associated with carcinoma of the stomach. It occurs also in old age when arteriosclerosis produces atrophy of the mucous membrane and may accompany chronic kidney, liver, heart, and lung conditions, especially tuberculosis and syphilis. Another and frequent cause is a neurosis, often a functional weakness of the secreting glands of the stomach, while in very many instances the condition is due to anæmia.

In functional achylia there is a functional change in the secreting glands of the mucous membrane. This condition may be inherited or acquired.

In the diagnosis of achylia the test-meal is of first importance. Mucus, HCl, and pepsin are entirely absent or present in only very small amounts. According to Schmidt, the combined acid is below 20. Stomach motility is increased.

The stomach contents are very lumpy, little digested, and often form large masses.

As to symptoms, there is often neither tenderness nor pain, but in some cases complaint is made of all possible variations of pain in the stomach and bowels, tenderness and distention, eructations, and vomiting. Diarrhœa may also be present.

The stool in the diarrhœa of achylia is often large and the loss of nitrogen three times as great as in normal cases.

The differential diagnosis between chronic gastritis and achylia is frequently difficult. In gastritis there is a larger amount of mucus, the gastric contents are thinner, the deficiency in HCl and ferments is greater, and the motility not so great and very often much reduced.

Also difficult is the differential diagnosis between achylia and carcinoma. In carcinoma there is often a palpable tumor, rapid loss of strength, positive Salomon reaction, and the presence of lactic acid and occult blood in the stool.

In the diagnosis of functional achylia the patient's history is essential as it is important to determine whether he has always been nervous and whether his body suffers from a general lack of tone.

In the case of persons who have a small and long thorax, sharp costal angle, a floating tenth rib, dropped heart, enteroptosis, congenital defects, and diastasis of the recti, and in young persons with hernia, an inherited functional weakness of the gastric mucosa may be indicated.

The splashing sound in the stomach denoting atony speaks more for functional achylia, as do also the signs of neurasthenia, hysteria, chlorosis, anæmia and marked exhaustion, the presence of neurotic pains in the gastric region, pain and distention after nervous excitement, insomnia, headache, and a change in the voice tones. Still another indication of this condition is given when the stomach symptoms and diarrhœa yield to dietetic treatment and building-up of the general health.

The prognosis is far better in functional, than in organic, achylia and that of the acquired functional achylia far better than that of inherited and constitutional achylia. In real atrophy of the mucous membrane the prognosis is unfavorable because the atrophied mucosa cannot be restored.

The author's conclusions are:

1. Functional achylia occurs far more frequently than organic achylia.

2. The differential diagnosis cannot always be established with certainty.

3. The etiology, the patient's history, the syndrome, and the laboratory and X-ray findings often lead to the diagnosis.

4. The signs of neurasthenia, asthenia, or a general enteroptosis point more to functional achylia.

5. If the presence of anatomic changes in the mucosa of stomach and bowel can be established by analysis of the stomach contents and of the stool, the condition is organic achylia.

G. W. HOCHREIN.



**Pauchet, V.: Gastric Surgery** (Chirurgie gastrique). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 420.

For the purpose of discussing what should be done in such cases Pauchet reports three accidents which occurred in the course of gastric operations.

The first accident was the tearing of the lower extremity of the spleen during the liberation of an adherent stomach. This occasioned a hæmorrhage which caused the patient's death the same day although a suture was placed in the spleen and the tear was covered with omentum. From this experience the author concludes that in accidents of this kind every precaution must be taken to procure good hæmostasis.

The second accident reported was the tearing of the stomach on the lesser curvature near the cardia in the course of the removal of an ulcer. In this instance Pauchet decided to sacrifice the whole stomach and performed an œsophagojejunostomy. The patient made a good recovery.

The third accident was the development of ischæmia of the transverse colon in the course of a gastrectomy for cancer. Instead of resecting the ischæmic portion of the colon and effecting an end-to-end anastomosis the author did a right hemicolectomy with an ileocolic anastomosis. The result was good.

W. A. BRENNAN.

**Seigrist, H.: Duodenal Diverticulæ.** *Cor.-Bl. f. Schweiz. Aertze*, 1919, xlix, 47.

As only about 73 cases of duodenal diverticulæ have been reported in literature it would seem that their occurrence is rare.

Seigrist reports the case of a man 48 years old who complained of gastric trouble. At the age of 23 he had an abdominal traumatism following which he felt sharp pains in the umbilical region. Shortly afterward an epigastric hernia developed. The pain did not disappear after a radical operation for the hernia. A small tumor the size of a pigeon's egg could be palpated to the right side of the vertebral column in the pyloric region. Radiography showed a round spot in the same region adjacent to the shadow of the duodenum which remained visible even after the bismuth meal had passed.

During an exploratory laparotomy a cystic tumor the size of a prune was found. This proved to be a duodenal diverticulum implanted on the second part of the segment of the intestine in the region of Vater's ampulla and united by adhesions to the head of the pancreas. The resection of the diverticulum was easily accomplished and the patient recovered. The diverticular sac contained intestinal fluid but no foreign body. Microscopically it consisted of a mucous coat with numerous Lieberkühn glands and a submucous coat with muscularis mucosæ containing Brünner's glands.

This was a case of false acquired duodenal diverticulum. The true congenital diverticulum with serous coat is very much more rare and is always observed in the first part of the duodenum.

In the author's opinion the formation of this

diverticulum was related to the traumatism reported in the patient's history. This traumatism probably also included the head of the pancreas and, by forming an area of diminished resistance, favored the evagination of the duodenal mucosa. The painful crises were probably due to the onset of diverticulitis which was indicated by the presence of pancreatic adhesions.

W. A. BRENNAN.

**Slocker: Use of a Free Graft of Omentum to Cover a Loss of Substance in the Jejunum** (Utilización de injerto libre de epiploón sobre perdida de substancia en el yeyuno). *Rev. Ibero-Am. de cien. méd.*, 1919, xli, 81.

In the course of an abdominal exploration Slocker found a loop of the jejunum incorporated with the colon in a mass of adhesions. On separating the two it was impossible to cover the site of the lesion in the jejunal loop with serosa. He therefore resected a strip about 10 centimeters long from the nearest healthy omentum and sutured it over the serous defect in the jejunum.

Such use of a free strip of omentum is not new although not common. In 1829 Jubert obliterated intestinal wounds with an omental graft. The method was then abandoned until Braun revived it in 1897 in a case of perforating gastric ulcer. More recently omentum has been used in cholecystectomies, to cover deep sutures of the stomach after resection of ulcers in the lesser curvature, and in the reconstruction of the common duct after operations on the biliary passages.

In the author's opinion the use of omentum is preferable to the use of any other kind of tissue for organs covered by peritoneum as it is the most analogous material, the quickest to adhere, and prevents posterior adhesions with neighboring organs. In his own case but for the use of this graft a perforation peritonitis, either general or local, would have resulted, and as a consequence either death or the formation of a jejunal fistula.

W. A. BRENNAN.

**Soederlund, G.: Subcutaneous Intestinal Ruptures** (Ueber subkutane Darmrupturen). *Nord. med. Ark.*, 1919, li, (Kirurg.) No. 5.

Soederlund's long article which makes up the entire issue of the magazine treats exhaustively of both intraperitoneal and retroperitoneal subcutaneous ruptures of the intestine.

A total of 16 intraperitoneal ruptures were operated upon, 11 in the surgical clinic at Upsala from 1910 to 1916, and 5 at the clinic in Göthenburg since 1916. The histories of the 11 cases in the clinic at Upsala are given in detail.

During the same period of time only one operation was performed for retroperitoneal rupture. Thirty-seven similar cases have been collected from the literature and are reviewed.

The symptoms of subcutaneous intraperitoneal rupture of the intestine are both local and general. The general symptoms consist of shock, quickened



pulse rate, and increased temperature, and are of little value in the diagnosis except in connection with the local symptoms. The latter, which consist of pain, a local muscular defence reaction and intense sensitiveness in the abdominal wall and rectum, are of value especially in the diagnosis and differentiation of rupture from simple intestinal contusion.

When the patient is admitted to the hospital the abdomen should be carefully examined every hour or even more frequently for the development of pain or the intensification of existing pain; also for tenderness on localized abdominal pressure and pressure per rectum. When, in addition to the general symptoms described, these findings are positive and there is dullness in the region of the injury, the indications point to rupture. Expectancy should be limited to one hour. If at the end of that time the patient's condition has not changed, he should be operated upon immediately.

In cases of intraperitoneal rupture Soederlund sutures the intestinal rupture or resects the intestine and then mops up the peritoneal cavity but does not wash it out. In 10 cases suturing was done, and in 1 case, resection. There were 8 complete recoveries and 3 deaths.

The operative treatment of retroperitoneal subcutaneous rupture of the intestine is especially troublesome. It is difficult to reach the posterior wall of the bowel, particularly in the duodenal region, and very difficult to plan the method and execute a suture. Moreover, suturing may not suffice.

A phlegmon usually develops. When situated on the right side, the phlegmon extends toward the right kidney and down along the psoas muscle into the pelvis. In the author's case a phlegmon developed on the left side. When death occurs it is generally due to diffuse peritonitis or the exceptionally toxic nature of the retroperitoneal phlegmon.

The difficulty of locating and treating a rupture, however, is not to be feared so much as the fact that in the laparotomy it may be overlooked by the surgeon altogether.

In 37 cases of retroperitoneal ruptures collected from the literature there were 8 in which no operation was done and 29 cases which were treated surgically. In only fifteen of the latter was the rupture discovered at operation. The others were found at autopsy. The examining surgeon may consider the condition due to retroperitoneal hemorrhage and close the abdomen with fatal result.

In the author's case the rupture was discovered during operation and sutured but the patient died after two days. In this instance the most characteristic finding was a limited bulging of the posterior parietal peritoneum just to the left of the duodenojejunal flexure.

In reviewing the literature Soederlund thinks it noteworthy that 3 patients with retroperitoneal duodenal rupture should have recovered after simple suture. Though difficult, therefore, this

procedure can be adopted with the hope of success and applied when (1) the rupture is small and does not exceed half the periphery of the intestine; (2) when the wall of the intestine in the vicinity of the rupture is not badly or extensively contused; and (3) when only a short time has elapsed between injury and operation, i. e., not exceeding twelve hours. This latter condition is very important as in a case in which suturing was done about seventeen hours after the injury death resulted from insufficiency of the sutures, whereas in another case, in which a similar operation was done nine hours after the injury, the sutures held.

If the above conditions are not met, resection may save the patient's life. Two cases in which a simple suture was done seventeen and twenty-four hours, respectively, after the injury terminated fatally. Both patients perhaps would have been saved by resection. Soederlund is of the opinion that the failure of the sutures to hold should be traced, not to the suture material, but rather to the special conditions surrounding a retroperitoneal rupture.

A short resumé of retroperitoneal ruptures of the intestine reported in the literature is appended to the article.

W. A. BRENNAN.

**Reed, R. J.: Intestinal Tumors. W. Virginia, M. J., 1919, xiii, 324.**

Bowel tumors are classified as malignant tumors and benign tumors. Among the former are carcinoma and sarcoma. Carcinoma occurs about twenty times as often as sarcoma.

Virtually half of all intestinal carcinomata are found in the rectum. It is a disease of advanced years which affects males three times as often as females. The carcinomatous growth is usually single and shows a tendency to early ulceration with bleeding and perforation into the peritoneal cavity or neighboring viscera. By the contraction of its fibrous stroma as it encircles the intestine it causes progressive stenosis. Secondary manifestations are found in the mesentery and peritoneum. An early symptom when these structures are involved is ascites. The further spread of the disease is by way of the lymphatics and blood channels, secondary tumors being formed in the liver and other organs.

Sarcoma is found about equally often in the large and small intestines. In the large bowel its most frequent location is the rectum. It occurs more often in men between the fortieth and fiftieth years of age. The tumor is usually large and is less likely to form stenosis than carcinoma but metastasizes earlier and develops more rapidly, causing death usually within one year, particularly when it involves the small bowel. Through the lymphatics and blood-vessels large tumors are formed in the mesenteric glands. Like carcinoma, sarcoma tends also to invade the surrounding structures.

Benign tumors of the intestines are less frequent than malignant tumors and may not give any indication of their presence. When they do, they mani-



fest themselves by intussusception of the intestine, malignant degeneration, or, after reaching considerable size, symptoms of obstruction due to narrowing of the lumen of the intestine, mechanical pressure, or angulation of the bowel. The cystic and dermoid varieties of tumors are the most rare.

The early symptoms of intestinal tumor are usually quite slight. Those of benign tumors remain slight, while in cases of the malignant type of tumor the peculiarly foetid character of the stools is soon noted. Only after partial obstruction of the intestine has occurred is any progress made in the diagnosis unless the growth is very large and the abdominal wall thin. The symptoms differ in chronic and acute obstruction. They are modified also by the anatomical site and the degree of the stenosis. Gastric disturbances followed by nausea are more prominent when the stenosis is high, though some gastric trouble is always present. Chronic obstruction is characterized by localized pain, tympanites, and peristaltic waves. As the waves become more intense, the pains become more severe. Food and the posture of the body are other factors modifying these symptoms.

A tumor in the large intestine causing partial stenosis produces symptoms which are less marked than those due to a similar tumor in the small intestine. The contents of the colon may collect above the obstruction and when this occurs constipation results which is followed by diarrhoea. If the discharge has a foetid odor and contains mucus and blood, it may be concluded that the patient has stenosis of the colon and possibly a new growth. In recent years the greatest aid in the diagnosis is the X-ray.

Resection of the segment involved is the only treatment in the early stages. In the advanced cases life will be prolonged by palliative procedures.

The writer has successfully used the following method of resection of the bowel:

A primary colostomy is performed and the location of the tumor determined. Four weeks later, the coccyx and 2 in. of the sacrum are removed. The hæmorrhoidal veins are ligated and the rectum freed extensively from its attachments in the upper two-thirds of its length. The pelvic floor is then opened and the tumor delivered, a strip of gauze being placed above it for the purpose of gentle and steady traction. The mesosigmoid vessels are ligated as high as possible. After the tumor has been excised, an end-to-end anastomosis is done and the rent in the pelvic floor repaired. An iodoform-gauze drain is inserted at about the site of the union and a rubber tube passed through the rectum beyond the anastomosis.

F. P. HAMMOND.

**Pagés, F.: A Case of Retrograde Strangulation of the Omentum** (Sobre un caso de estrangulación retrógrada de epiplón). *Rev. españ. de cirug.* 1919, 1, 21.

The term "retrograde strangulation" was applied by Maydl in 1895 to cases in which a long loop of intestine becomes wholly introduced into a hernial

sac in such a way that there is a return into the abdomen of the central part of this loop while the two extremities remain incarcerated. The circulation in the portion of the loop in the abdomen then becomes arrested owing to the pressure at the mouth of the sac. A variety of the condition is found when two distinct loops of small intestine become incarcerated in one sac, the intermediate portion of the intestine lying outside. Usually the latter becomes necrotic owing to the obstruction of its circulation, but the parts within the sac may also undergo the same alterations.

In the case detailed by Pagés the omentum in the region of Gimbernat's ligament was incarcerated in a hernial sac in this manner, and the portions both inside and outside of the sac were gangrenous. The gangrenous portion was completely resected and the patient made a complete recovery.

W. A. BRENNAN.

**Bull, P.: The Clinical Diagnosis of the Pathologic-Anatomic Changes Which Occur During the First Three Days of Acute Appendicitis** (Le diagnostic clinique des altérations pathologiques anatomiques durant les trois premiers jours de l'appendicite aiguë). *Nord. med. Ark.*, 1919, li, (Kirurg.) 297.

As without doubt most of the danger from acute appendicitis depends upon the changes which take place in the appendix, the ability of the physician to determine from the clinical symptoms just what changes have occurred in a given case would be of the greatest value.

Bull studied 217 cases of acute appendicitis from 1908 to 1917. One hundred and seventy-seven of these patients were operated upon during the first seventy-two hours but only 161 were submitted to a complete systematic examination.

Five different positions in which the appendix may be found are recognized: (1) situs pelvinus; (2) situs mesocolicalis; (3) situs anteroparietales; (4) situs retrocæcalis; and (5) situs lateralis. In the 174 cases reported the appendix was found toward the median line in 58.6 per cent, behind or to the side of the cæcum in 35.6 per cent, and touching the anterior abdominal wall in 5.8 per cent.

The presence of deep gangrene or perforation can frequently be determined with certainty in the course of the first twenty-four hours and often in the first twelve hours. When the appendicitis tends to destroy the appendix, the destruction usually takes place during the first forty-eight hours and in many cases before the end of the third day. The diagnosis of acute appendicitis was correct in 95.5 per cent of the cases. Those incorrectly diagnosed included acute gastro-enteritis, paratyphoid and retroperitoneal or mesenteric acute lymphadenitis. The latter is extremely difficult to differentiate.

In concluding, Bull expresses the opinion that the absence of one or even several of the common symptoms (vomiting, rapid pulse, etc.) is no index



of the pathologic-anatomic changes in the appendix. One of the best aids in the diagnosis is the old rule that if, after twenty-four hours and in spite of rational treatment, the symptoms do not abate, the appendicitis is probably destructive. When a single symptom persists which renders the experienced physician uneasy, the condition is worse than might otherwise be supposed.

The author discusses the clinical symptoms as regards pain, pulse rate, temperature, stools, bladder findings, etc., in detail and describes the manner in which they indicate the pathologic conditions in the appendix and peritoneum. The accuracy of the clinical diagnosis as demonstrated by the operative findings in the cases reported is shown in the following table:

Clinical Diagnosis	Position of Appendix	Changes in Appendix	Changes in Peritoneum	Acute Appendicitis
Correct.....	80	122	122	169
Incorrect.....	25	25	22	6
Doubtful before operation.....	8	1	3	2
Not decided before operation.....	39	13	14	...
	161	161	161	177

The figure 177 in the last column includes the 16 cases in which the complete systematic examination was not made.

From this table it is evident that the position of the appendix was correctly determined before operation in the majority of the cases and the pathologic changes in the appendix correctly determined in 82.4 per cent. The diagnoses of the changes in the peritoneum were in close accord with those of the changes in the appendix.

W. A. BRENNAN.

**Dubs, I.: Acute Appendicitis in the Old. Cor.-Bl. f. Schweiz. Aerzte, 1919, xlv, 172.**

Acute appendicitis is rarely seen after the fiftieth year of age. In 1,500 cases of appendicitis treated during three years by the author, nineteen of the patients were between 50 and 60 years old, four between 61 and 70 years, and two, 72 and 76 years old. Five per cent of the cases, therefore, were those of old persons.

In the aged, acute appendicitis is manifested under two clinical forms: (1) a diffuse perforation peritonitis accompanied by high fever and a very rapid pulse which quickly follows the usual gastrointestinal picture and has a very unfavorable prognosis, and (2) the encysted pseudoneoplastic type which is that of the majority of cases.

The most essential characteristic of the development of appendicitis in old age is the fact that the general symptoms are entirely secondary to the local symptoms. In about 60 per cent of the cases the pulse and temperature are almost normal even when the appendix is the site of severe lesions. Vomiting is rare. On the other hand, the local muscular contraction is almost always very marked

and there is extreme sensitiveness to pressure even when no local lesion can be recognized by palpation or percussion. Therefore the local phenomena have a very distinct diagnostic value.

The treatment of acute appendicitis in the aged must be surgical. In all cases, even when it is a matter of a clearly encysted abscess, it is necessary to remove the appendix to prevent new crises. The operative prognosis is less unfavorable than might be expected. In the author's cases, the mortality was only 12 per cent.

W. A. BRENNAN.

**Pfahler, G. E.: The Roentgen Rays in the Diagnosis of Appendicitis. Am. J. Roentgenol., 1919, vi, 78.**

While in acute appendicitis the X-ray diagnosis is rarely necessary, it may be of value as occasionally the disease may be simulated by developing pneumonia of the lower lobe. In obscure cases, also, the diagnosis may be cleared up by filling the colon to demonstrate the existing relations.

Chronic appendicitis is often found in patients referred for a study of the gall-bladder, duodenum, or kidneys. In such cases, a careful X-ray examination of the entire tract is necessary.

The appendix is most readily demonstrated at eight and twenty-four hours after the ingestion of the barium meal.

Localized tenderness of the visualized appendix upon pressure, whatever its position in the abdomen, is the most reliable symptom. The absence of tenderness at McBurney's point is of little value as a negative sign. Tenderness when present may be vague if the appendix is behind the cæcum but will become pronounced if the patient can be turned so as to bring direct pressure upon the appendix. The presence of tenderness of the appendix with fixation of the cæcum is strong evidence of appendicitis.

In the majority of cases the appendix can be demonstrated after a barium and buttermilk meal if searched for at eight and twenty-four hours. Frequently it can be observed on manipulation in the screen when it is impossible to see it in plates.

Fixation, though a valuable sign, is not constant. When fixation and tenderness are both absent, it is very probable that the condition is not appendicitis.

Fixed angulation is very commonly due to adhesions and has distinct significance.

Constriction, dilatation, and irregularities of the lumen can be demonstrated and all have pathologic significance.

Abnormal retention is present if the appendix remains filled after the cæcum is empty.

Incompetency of the ileocecal valve is demonstrated by regurgitation of the contents of the colon at even thirty-six and forty-eight hours.

Among conditions simulating appendicitis Pfahler has seen enterolith in the cæcum, adhesion of the cæcum to the side of the rectum, carcinoma of the cæcum, psoas and iliac abscess, and urinary (particularly ureteral) calculus.

D. R. BOWEN.



**Zapata, B. H.: The Surgical Treatment of Chronic Constipation** (Tratamiento quirúrgico de la constipación crónica). *Crón. méd.*, 1919, xxxvi, 1.

The author believes that the only effective treatment of chronic constipation is surgical treatment. Persons with constipation he divides into two classes: (1) those in whom the intestinal drainage can be re-established by destruction of constricting bands or simple fixation of the intestine; and (2) those in whom a colectomy, a short-circuiting operation, is necessary to restore the normal intestinal function.

The various accepted methods of dealing surgically with constrictions in different sections of the small intestine and colon are reviewed as are the clinical histories of eight patients treated by operation. These were cases in which obstinate constipation was due to peritoneal adhesions. The operative results were quite satisfactory. W. A. BRENNAN.

### LIVER, PANCREAS, AND SPLEEN

**Ribas y Ribas: Cholecystendysis, Cholecystostomy and Cholecystectomy** (Colecistendysis, colecistostomia y colecistectomia). *Rev. españ. de med. y cirug.*, 1919, ii, 1.

Ribas y Ribas calls attention to the necessity of early operation in gall-stone disease in order to obtain the best results.

More than half of the patients suffering from biliary lithiasis do not show the symptoms of biliary colic and the diagnosis is made from a syndrome at times vague and indefinite but always having its origin below the liver. The presence of icterus must not be relied upon.

From the form of the stones expelled data may be obtained as to the prognosis. A round cholesterol stone is aseptic and causes but few lesions. A non-homogeneous and irregularly shaped calculus denotes infection and the presence of other calculi.

Progress in the study of pathologic anatomy has demonstrated the presence of Luschka's diverticulæ in the walls of the gall-bladder. In these, owing to the spread of the infection, possible stasis, and their similarity in structure to the gall-bladder, independent calculi may be formed and call not only for the removal of the calculus but also for the extirpation of the gall-bladder.

Lesions of the gall-bladder due to calculi are of acute and chronic types. Those of the acute type may be gangrenous, perforating, and suppurative. Surgical intervention is therefore necessary. Chronic lesions of the gall-bladder, such as cholecystitis, may be tolerated by the organism as long as the ducts remain permeable. When the lesions are intense and there is associated pericholecystitis, intervention may be indicated to prevent continuous suffering.

Lesions of the gall-bladder due to calculi may lead to numerous complications: by the hepatic route, to subphrenic abscess; by the canalicular route, to lesions of the duct, pancreatitis, biliary

phlegmons, and intestinal perforation. Subphrenic abscess, biliary phlegmon and suppurative subhepatic peritonitis call for drainage. In pancreatitis drainage of the common duct and extirpation of the gall-bladder is necessary. Operation should be performed also when in a case of fistula between the gall-bladder and the intestine the general health does not improve rapidly.

On the basis of our knowledge of pathologic anatomy, both cholecystendysis and cholecystostomy should be discarded.

Cholecystectomy is the operation of choice in the treatment of calculus. Cholecystostomy is to be regarded only as an operation of necessity when the gravity of the case demands immediate operation and the gall-bladder must be preserved.

In 27 cases of simple cholecystectomy there was one death. This patient had a hydatid cyst of the liver. All of the others recovered. In 70 cases in which the hepatic duct was drained there were 13 deaths. The author considers a primary acute cholecystitis more to be feared than a very acute crisis in an old chronic case.

Operation was performed also in 10 cases of subphrenic abscess traceable to gall-stones and in 12 cases of hæmorrhagic pancreatitis.

W. A. BRENNAN.

**Mercadé, S.: Biliary Fistula Treated by Direct Hepaticoduodenostomy** (Fistule biliaire; guérison par une hépatico-duodénostomie directe). *Bull. Acad. de méd.*, Par., 1919, lxxxi, 208.

Anastomoses of the hepatic duct with the intestines are rare, the author having found only 5 such cases reported in the literature. On account of its difficulty, the operation is done only as a last resort when there is no other means of establishing the continuity of the biliary flow. The trouble arises from the presence of multiple adhesions and the fact that the hepatic duct, which is normally very short, has been further reduced in length by chronic inflammation. An anastomosis with the duodenum is preferable to an anastomosis with the jejunum, and to overcome the difficulty of bridging the distance a few surgeons have attempted an autoplasty with the aid of a rubber tube wrapped in omentum.

The case reported was that of a woman 54 years of age who was operated upon for a suppurative calculous cholecystitis. The gall-bladder was removed and the hepatic duct drained. A persistent biliary fistula resulted which was operated upon after three months. At that time the stomach, liver, colon, and duodenum were found to be involved in a mass of adhesions and a very minute and laborious dissection of the organs was necessary. The hepatic duct, which was very short but normal in character, was finally dissected from the lower surface of the liver. Direct anastomosis of the duct with the duodenum after the latter had been fixed to the liver was extremely difficult. When finally effected, the union was strengthened by fixing



strands of omentum over the sutures. The post-operative course was excellent. After the eighth day the bile flow was normal. The patient has remained well.

W. A. BRENNAN.

**Ogden, C. R.: How Shall We Treat the Infected Gall-Bladder and Bile-Ducts?** *W. Virginia M. J.*, 1919, xiii, 321.

Many patients treated for indigestion, nervous dyspepsia or gastralgia, and even many of those brought to the operating room for appendicectomy, are found to have gall-stones or infection of the gall-bladder or ducts. Experience also has shown that gall-stones and kindred affections very commonly exist along with chronic surgical lesions of the lower abdomen.

Although surgeons do not agree as to the method of treating such conditions, it would seem there could be no argument against removing a gall-bladder which is so diseased that its function is lost, its duct obliterated, and it has become a dangerous irritant to the organism. On the other hand, when there are stones of recent formation or the bile has become infected, draining the bladder by one of the usual methods seems best. In such cases the gall-bladder may be restored after the infection has cleared up. In some instances it may never function again but its presence in the body does not endanger life and it will afford the surgeon a good landmark in subsequent operations on the bile-ducts or adjacent organs should they be necessary.

The removal of the gall-bladder regardless of the pathology in cases of infection with or without stones is a dangerous and unwarranted procedure.

In performing either cholecystotomy or cholecystectomy, the bile-duct should always be observed and carefully traced.

F. P. HAMMOND.

### MISCELLANEOUS

**Jungblut, H. C.: The Significance of Abdominal Pain.** *J. Iowa M. Soc.*, 1919, ix, 38.

The author warns against the danger of permitting preconceived ideas to bias the physician's judgment, or the importunities of the patient or his friends for the relief of the pain to distract him from the vital necessity of knowing its exact cause. Especially warned against is the administration of an opiate until the physician is certain that it will not cloud the symptoms and thus prevent a diagnosis.

Mention is made of the importance in the interpretation of abdominal symptoms of Sir James Mackenzie's hypothesis of the so-called visuosensory or visuomotor reflexes. The board-like rigidity of the rectus and upper abdominal muscles following the perforation of a duodenal ulcer, and the rigidity of the muscular wall over the site of an inflamed appendix are examples of these reflexes.

Pain in the distant areas, the so-called referred pains, must always be borne in mind as their true association may prove very helpful. They are accounted for by the course of embryonic develop-

ment of the tissues. To illustrate, the author cites the pain felt in the testicle in renal colic which he ascribes to the fact that in passing down to the scrotum the covering of the testicle receives a branch from the first lumbar nerve. When the center of the nerve is irritated or stimulated, as in renal colic, the pain radiates to the testicle, and constitutes a pathognomonic sign of renal trouble. Another example is coronary sclerosis in which the referred pain often passes to the epigastrium instead of into the axilla or down the inside of the arm.

In gall-stone disease, shoulder pain is not an infrequent complaint and may persist with such severity that the cause may be overlooked and the condition considered to be neuritis. The expulsion of a gall-stone is followed by instant relief.

Another fact to be borne in mind is that the subjective symptoms of pain are modified by individual idiosyncrasy.

H. J. VAN DEN BERG.

**Beals, L. S., Blanton, W. B., and Eisendrath, D. N.: Abdominal Complications of the Influenza Epidemic at Camp Custer, Mich.** *J. Am. M. Ass.*, 1919, lxxii, 850.

Whether the rigidity and tenderness which occurred sometimes in the first twenty-four hours was due to an acute abdominal affection or to muscle spasm from lesions of the chest has not been ascertained.

A number of patients who complained of dull aching pain in the right lower quadrant later showed symptoms of bronchopneumonia. Often these pains ceased in a short time, but when they continued an appendectomy was performed.

Of 140 patients with bronchopneumonia, 6 had acute peritonitis. In 4 it was generalized and in 2 in the upper left quadrant, suggesting an origin by direct extension through the diaphragm. In every instance a hæmolytic streptococcus was recovered. The appendix and gall-bladder were not changed except on the serous coat. Five of 6 cases of peritonitis found at autopsy showed generalized infection which was evident also in the pleura and pericardium.

One patient admitted October 8 with bronchopneumonia involving both lower lobes developed on November 25 a severe pain in the left lower quadrant of the abdomen which was accompanied by slight distension but no rigidity. The chest was aspirated three times, amber fluid, pus and sero-hæmorrhagic fluid being obtained. On pushing the needle deeper, a thick yellow pus was aspirated. A costectomy was performed and 1,500 cc. of fluid withdrawn. The tenth rib was resected after exploratory puncture. An incision then made through the diaphragm revealed a subphrenic abscess from which 125 cc. of dark pus was evacuated. Good recovery followed.

In another case of bronchopneumonia pain developed in the left upper quadrant. In this instance 90 cc. of chocolate-colored pus were evacuated through an incision in the eighth interspace

from the left subphrenic region. Symptoms of generalized sepsis followed and the patient died. At autopsy it was found that the lower left lobe of the right lung was adherent to the diaphragm, the left lung was covered with a thin yellowish exudate, and there were abscesses in the liver, generalized peritonitis, and suppurative pyelephlebitis.

Jaundice was found in 7 per cent of the autopsies, and in all but one a bacteræmia was demonstrable.

The spleen was very little enlarged, moderately firm and red, and showed marked congestion.

Acute congestion of the kidneys and pyelitis were often found. In the case of one patient with influenza who had a constant aching pain in the right side of the abdomen with rigidity and tenderness, a temperature of 101 to 104, and a high leucocyte count, turbid urine was excreted from the right kidney and clear urine from the left. A mass was palpated in the region of the former, and on operation a large perinephritic abscess was found.

Rupture of the rectus muscles occurred frequently, usually midway between the symphysis pubis and the umbilicus, bilateral, and never complete. Weakened by abscess formation, the muscle probably became ruptured during violent coughing.

Thrombophlebitis occurred four times and in three instances led to pulmonary embolism. Blood cultures were negative. F. P. HAMMOND.

**Montgomery, E. E.:** The Importance of Diagnosis in Pelvic and Abdominal Surgery and Some of the More Common Errors. *Am. J. Obst.*, 1919, lxxix, 321.

The value of diagnosis cannot be disputed in any line of surgery. Upon the diagnosis will depend not only the site of the incision, but the organs or structures subjected to operation. The character of the operative procedure, the relief afforded the patient, and his future comfort and life may all depend on the diagnostic skill of the operator. It

consequently becomes incumbent on the surgeon to utilize all the aids at his command. These should be:

1. A carefully written history of the previous health and the course of the present disease.

2. A careful study of the physical signs from the affected organ as well as those having their origin in remote organs which possibly may exercise a baneful influence and often may resemble those arising from actual disease of the organ under consideration.

3. The chemical and microscopic study of the blood, secretions, and excretions.

4. The employment of the roentgen rays.

The examination of the rectum by palpation should be a routine part of the first examination of every woman suffering from pelvic disease. The nerve relation of the rectum, genital structures, and bladder is so intimate that disturbance in one may readily be mistaken for lesions of one of the others. Such an examination will not infrequently reveal an unsuspected carcinoma of the rectum. In carcinoma of the cervix, the rectum affords the best route by which to determine the extent of infiltration that has occurred in the broad ligaments.

Probably the most frequent site of error in diagnosis in the case of women is the right side of the abdomen. Inflammatory conditions of the tube, ectopic gestation, with or without rupture, torsion of the pedicle of an ovarian cyst or a cyst of the broad ligament, disease of the ureter, the passage of a calculus, and empyema in a dragging gall-bladder have been mistaken for appendicitis. On the other hand, appendicitis in an appendix hanging over the brim, or a resulting pus collection in the pelvis as a complication in the parturient woman or a woman who has recently undergone an abortion, are easily mistaken for tubal, or some other form of genital, infection.

EDWARD L. CORNELL.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. CONDITIONS COMMONLY FOUND IN THE EXTREMITIES.

**Eikenbary, C. F.:** The Treatment of Chronic Osteomyelitis Due to Gunshot Injuries. *J. Orthop. Surg.*, 1919, i, 115.

The procedure described for cases of chronic osteomyelitis is as follows:

After application of the tourniquet, a long incision is made over the necrosed area. The bone is exposed and search made for the sequestrum. The bone over the necrosed area is then chiseled away for a distance approximately 1 inch below and above the diseased region, the chisel being driven in a slanting direction rather than at a sharp angle. The wound is packed with sterile gauze which is removed after 24 hours.

The purpose of the operation is to get rid of the necrotic bone without leaving any cavity or rough spicules.

A. STEINDLER.

**Beck, H. G., and McCleary, S.:** Multiple Myeloma with Bone-Marrow Plasma Cells in the Blood; Report of Case. *J. Am. M. Ass.*, 1919, lxxii, 480.

Since Bence-Jones discovered albumose in the urine in cases of multiple myelomata, the condition has been recognized more often.

The case reported was that of a farmer 55 years of age. Five years previously he had had typhoid fever and since that time, substernal pains which were worse in the spring and fall. Associated with these pains were hacking cough and dyspnoea. The patient had lost 26 lbs. in weight and was growing weaker.

Examination showed an emaciated man who had



pyorrhœa, enlarged, cervical glands, and a swelling at the sternal end of both clavicles. Heart dullness was increased to the left. Apical systolic and presystolic murmurs and pulmonary rales were heard. The X-ray examination was negative. The urine showed protein resembling Bence-Jones albumose.

When seen for the second time about six months later the patient had pneumonia and a pathologic fracture at the juncture of the manubrium and gladiolus. The blood examination showed among other things the presence of bone-marrow plasma cells. The patient died. At autopsy, bone-plasma cells were found in the liver and blood and in smears made from the affected bones, the sternum, clavicles, and ribs.

I. E. BISHKOW.

**Dionis du Séjour: Bone Fistulæ** (Fistules osseuses).

*Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 42.

The surgical cure of a bone fistula is frequently only temporary. New fistulous tracts are formed with diverticulæ filled with excrescences, the sequelæ of the old osteitis.

Having tried various ways of filling such diverticulæ, the author recommends the following method:

1. A careful radiologic study should be made of the tract in two planes.
2. Resect as much of the scar and fistulæ as possible.
3. Empty the diverticulum and curette the excrescences.
4. All cicatricial tissue should be resected as far as healthy tissue.
5. Cut off a well-nourished strip of muscle and fat without cicatricial tissue.
6. Introduce the strip into the cavity and fix it in place with sutures.
7. Insert filiform drains.

W. A. BRENNAN.

**Dujarier, C.: Pseudarthroses of the Humerus**

(Sur les pseudarthroses de l'humerus). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 179.

Dujarier has treated 35 cases of pseudarthrosis of the humerus due to war wounds. There are two types: (1) the type in which the loss of bone is very extensive and the arm is quite weak, and (2) the type in which the loss of bone is slight, not exceeding a couple of centimeters.

The form and position of the bone ends are studied radioscopically.

In certain pseudarthroses near the articulation ankylosis is to be feared, but the author has never observed a case of this kind. The muscles near the pseudarthrosis are usually more or less destroyed, partly because of the original traumatism and partly because of invasion by cicatricial tissue.

Operating upon a traumatic pseudarthrosis before cicatrization of the wound is not the treatment of choice. The author prefers to delay operation until a month or two after cicatrization. When a fistula is present, it is treated before the pseudarthrosis.

It is not necessary to restore the bone to its proper length by means of a graft for in the arm a little shortening is not of much consequence. Many patients have made good functional recoveries even with 10 cm. of shortening.

In the treatment of pseudarthrosis the author has tried different methods of osteosynthesis. Most frequently use is made of metallic plates, those of Lane, Sherman, or Lambotte. In 15 cases such plates gave 8 consolidations and 5 failures. The other two patients are still under treatment.

In some cases silver wire sutures were used after the bone ends had been cleaned and freshened. In 8 such cases there were 6 successes and 1 failure. One patient is still being treated.

In 4 cases in which metallic clips were used there was 1 recovery.

In 10 instances the osteoperiostic method of Delagenière gave 6 consolidations and only 1 failure. Three of the patients are still under treatment.

The condition to be feared in the treatment of pseudarthrosis is suppuration. In the 35 cases reported only 18 were aseptic. An aseptic reunion is obtained in only half the cases. In severe infection the wound is left open or drained.

To sum up, the author obtained in his 35 cases, 21 complete consolidations and 7 half successful results. Seven patients are still under treatment. The time required for consolidation varied from one to twelve months.

Better results were obtained with the humerus than any other bone.

W. A. BRENNAN.

**Coudray, P.: Two Cases of Superior Bilateral Radiocubital Synostosis of Congenital Origin**

(Deux cas de synostose radio-cubitale supérieure bilatérale d'origine congénitale). *Rev. d'orthop.*, Par., 1918, vi, 361.

Coudray states that there have been a number of reports of total or partial absence of the radius. In 1907 Rais collected 24 cases of congenital radiocubital synostosis. In 20 of these, other local congenital defects, luxation of the radius, absence or atrophy of the upper part of this bone, were also present. In only 4 cases was the synostosis uncomplicated, and in 3 of these it was bilateral.

In one of the two cases of bilateral radiocubital synostosis reported by the author it appeared at first sight that the condition was uncomplicated, but later atrophy of the cubitus on both sides was found. In the other case there was atrophy of the head of the radius on both sides. No operation was performed.

W. A. BRENNAN.

**Dujarier, C.: Pseudarthrosis of Both Bones of the Forearm**

(Des pseudarthroses des deux os de l'avant-bras). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 327.

In a total of 128 cases in which Dujarier operated for pseudarthrosis he saw only 15 cases in which the two bones of the forearm were involved. Usually



both bones are fractured transversely by the same projectile. When pseudarthrosis occurs it is generally due to the interposition of muscle between the fragments.

Dujarier's technique in the treatment of this condition is to dissect out the four fragmental ends, cleanse the area, remove the periosteum, freshen the bone ends, put them in correct position, and suture with silver wire. Occasionally it is necessary to encircle a bone with wire in order to insure perfect coaptation. In one case a gap in the radius was bridged with a piece taken from the ulna.

In the 15 cases 15 consolidations were obtained, 3 of these being incomplete. Ten of the cases were aseptic. Suppuration occurs in the forearm less frequently than in the humerus. W. A. BRENNAN.

**Harding, M. C.: Severe Acute Sprains of the Knee-Joint.** *J. Orthop. Surg.*, 1919, 1, 152.

The author reports 70 cases of severe acute strain of the knee-joint in his service while Chief of the Section of Orthopedic Surgery at Camp Lewis.

The strains were classified as follows:

General sprain, 40 per cent; of internal lateral ligament, 42 per cent; of internal semilunar cartilage, 31 per cent; of external lateral ligament, 1 case; periosteal tear, internal condyle of femur, 2 cases; cracks of patella, 3 cases.

Twenty of the patients gave a history of previous injury. All had effusion. Sixty-five per cent. were aspirated and in 87 cases there was bloody fluid ranging from blood-stained synovia to nearly pure blood. The average amount of fluid aspirated was 63 cc. Cultures and smears were negative and the X-ray findings mainly negative. Three cracked patellas, 3 old dislocated semilunar cartilages, and thickened and calcified alar bursæ were noted. In 2 cases there were periosteal tears of the internal lateral ligament from the inner condyle. The damage to the capsule ranged from stretching to tearing.

The most important factor in producing disability and slow recovery is the stretching of the capsule by effusion. The venous engorgement on the sixteenth day is very pronounced. The alar bursæ are thickened and involved in the general reaction. Early motion and weight-bearing are obviously contra-indicated.

The patients are placed on a posterior splint and examined with the X-ray. Effusions are aspirated, aspiration being done under rigid aseptic precautions without any anæsthesia and with a moderately coarse Luer syringe needle. The method is described as follows: Locate the outer edge of the patella. Then, one finger's breadth below its upper end, point the needle inward at right angles to the extended leg and tilt it backward to clip in under the edge of the patella. Then pass it in a distance of 2 ins. and withdraw the plunger of the syringe. If not successful, proceed  $\frac{1}{2}$  in. deeper until bone is struck. The needle then lies in a hollow between the

condyles and immediately behind the patella. Withdraw the fluid, milking the knee cavity toward the point of the needle. Close with collodian. Next apply a cotton compression bandage, and if the knee is painful a posterior molded splint. Keep the patient in bed. When the swelling is gone, he can be allowed up on crutches, but the foot should not be permitted to touch the floor. In a few days, if there is no pain or swelling, slight weight-bearing, which is gradually increased, may be allowed. If swelling occurs, the patient should be returned to bed. From the beginning bake the knee with an electric baker and apply gentle massage. The posterior splint should be removed as soon as the pain is gone. When the patient is able to walk, two five-yard flannel bandages should be applied daily in the form of a figure of eight and used for at least three months.

Patients with strains of the semilunar cartilage are kept on posterior splints for four weeks and should not be operated upon until the reaction has subsided. One patient who was operated upon at five weeks did better than another upon whom an operation was performed at two weeks.

Strains of the knee-joint may be subdivided into general strains with moderate effusion which will get better on the "let alone" plan and strains with bloody fluid which tend to recur. In the latter there are definite capsular injuries, usually of the internal lateral ligament and the inner meniscus, and occasionally of the bone. These cases require two to four months of treatment.

L. C. DONNELLY.

**Smith, E. H.: The Human Foot, Both Normal and Pathological, Exclusive of Most Types of Congenital Defect.** *N. York M. J.*, 1919, cix, 225.

After reviewing various methods suggested for determining what constitutes a normal foot, the author states that the study of the skeleton indicates that most reliable as the axis of such a foot would be a line extending from the middle of the tuberosity of the os calcis through the middle of the articular surface of the astragalus and following the inner side of the head of the metatarsal bone of the great toe. This line may vary a trifle by falling through the head of the metatarsal bone and in the feet of primitive people not much given to wearing shoes it would be found to intersect the great toe.

Nearly all infants have flat foot because the bones of the mediatarsal region are undeveloped. As ossification progresses in the normal foot, the arches adjust themselves. If ossification is delayed the foot becomes the type known as "weak foot." The X-rays are of the greatest importance in determining the presence of this condition. If a weak foot is not put up in overcorrection and carefully held in proper position when the child is walking, it will almost certainly become an organic flat foot. In the average person who had normal feet in infancy and childhood the subsequent development of flat foot



is due to poor shoes, poor muscular development of the legs, continuous walking on hard surfaces, or to an occupation which necessitates long hours of standing or the carrying of heavy weights while walking on hard floors.

The deformity in flat foot is not due to rotation of the foot as a whole but begins as a buckling of the longitudinal arch inward, after which the apex, as represented by the scaphoid bone, may sag downward. The whole foot in front of the head of the astragalus is abducted as is also the os calcis. This causes deviation from the normal line at the back of the leg. The bones are jammed in the whole metatarsal region and if the condition is not corrected during adolescence they will become distorted like the vertebræ in scoliosis. There is nothing resembling pronation in this condition.

It is often stated in discussing flat foot that the falling of the arch is due to stretching of the plantar structures. This is impossible. Most of the plantar structures are composed of white fibrous tissue which will not stretch but invariably ruptures if forced beyond its strength. The longitudinal arch bears the same relation to the soft plantar structures that a bow does to the cord. If a force be placed upon the convex surface of the bow beyond its strength it buckles in one or the other direction laterally. This is similar to what happens in the flat foot but not until the anterior and posterior muscles have become weakened and partially atrophied. In the meantime the peronei muscles and the muscles of the calf of the leg have contracted, the former from overaction and the latter from the attempt to make them do the work of the tibials. As soon as the deformity has become established pain and soreness are frequently felt in most of the muscles of the leg.

Paradoxical though it may seem, claw foot may exist with well marked so-called flat foot. The co-existence of the two deformities is due to contraction of the plantar tissues accompanied by an inward bulging of the arch. A subcutaneous tenotomy of the tendo achillis and division of the contracted band of plantar tissue with overcorrection of the arch and incasement of the foot in plaster of Paris will give most excellent results.

The most rigid and intractible type of flat foot is produced by gonorrhœal arthritis. The foot bulges at the juncture of the scaphoid with the head of the astragalus abruptly inward but there is no inward bulging of the whole longitudinal arch as in ordinary flat foot. The condition is very painful and progresses rapidly. Feet of this type should not be subjected to the pressure of arch supports or special shoes until they have been kept in plaster of Paris for several weeks and the original source of the infection has been eradicated. Never under any circumstances should an attempt be made to correct such a foot under an anæsthetic. The correction will fail utterly and excite the most serious arthritis.

Sheet wadding should have no place in surgery.

Good absorbent cotton properly cut, applied smoothly, and bound down by a thin gauze bandage makes an ideal dressing. Plaster of Paris when applied to the foot should be filled in underneath the arch so as to give a sort of rocker shape to the sole of the dressing. This serves two purposes: it prevents the dressing from breaking down and enables the patient to walk comfortably without the use of the ankle joint.

Very much of the plaster of Paris work of the present day is poorly done. Sayre in describing the method of making plaster of Paris bandages said: "Get crinoline, wash out the starch, and dry carefully, and then make the bandages." Physicians have ignored his advice in regard to washing out the stiffening. At the present time this stiffening is not starch but glucose sizing. Glucose syrup has a partially solvent effect on plaster of Paris. The glucose sizing in the crinoline used in most hospitals makes the plaster dressing damp and cheesy and causes it to crumble. Unsized gauze with a coarser mesh than the ordinary gauze should always be used. The plaster applied should be dental impression plaster, a most excellent modification of which is obtained by adding to it 5 per cent of white cement such as is used to set white tile. Feet affected with chilblains should never be put up in plaster of Paris.

Arthrodesis performed in the usual way, or by some of the newer methods in which a bone graft is inserted, is of doubtful expediency. Frequently when a bone graft is used the denudation of the bone from its articular cartilage is not thoroughly done, with the result that there is nonunion and the bone graft promptly breaks.

Metal arch supports should be obsolete as there is seldom a case requiring their use, and any arch support is utterly useless if placed in a shoe with a weak shank. The supports found on the market serve only to perpetuate the deformity and bruise the metatarsal bones, sometimes leading to serious arthritis.

Arch supports should be made of a good quality piano felt properly shaped so as to raise the foot underneath the ankle joint and not so much under the scaphoid and internal cuneiform bones. They should be the shape of the normal foot and very light and flexible. When put inside of a shoe with a strong shank such a support will hold the patient as well as any other.

The swing-last shoe has no effect in preventing or curing flat foot. It will ruin the metatarsophalangeal joint of the little toe and cause pain in the third, fourth, and fifth toes.

In cases of flat foot a breaking-down of the transverse arch with metatarsalgia is frequently noted. This is due, not to a pinching of a nerve trunk between the heads of the metatarsal bones, but to an arthritis in the metatarsophalangeal joints usually of the second and third, or the third and fourth toes. The condition is nearly always accompanied by one or more calluses underneath the ball of the foot.



Frequently the extensor tendons are contracted and the toes stick up after the fashion of a duck's head and neck. Careful manipulation of the joints involved will show them to be inflamed and very sensitive. A pear-shaped pad of piano felt glued to an insole or to the sole of a felt arch support so as to lift up the second, third, and fourth metatarsal bones, but never the first and fifth, will relieve this condition or cure it.

Also associated with flat foot we often find bunions with hallux valgus. Barring cases in which caries is present, the joint should never be resected and the head of the metatarsal bone should always be spared. Transplantation of tendons in this condition is unwarranted. Watson-Cheyne's operation, which is described in detail, gives the most admirable results and leaves the foot unblemished.

**Jauristi, V.: On Certain Dystrophias of the Limbs** (Sobre algunas distrofias de los miembros). *Rev. españ. de cirug.*, 1919, i, 87.

Having investigated the origin of certain limb dystrophias the author disagrees with the generally accepted ideas regarding them. His conclusions from his studies are as follows:

1. Among the effects of white swelling are certain trophic disturbances which are quite independent of the tuberculous lesions proper. In the first group is hypertrophy which often involves the whole limb, is due to medullary reaction, and has been wrongly attributed in many cases to assumed positions of the limb. The second group includes adiposis, amyloid degeneration, fibrosis, and calcification which are inflammatory rather than follicular or specific lesions produced locally by the Koch bacillus. In the third group are regressive changes, atrophy, ankylosis, and vicious fixations which the author believes are sympathetic dystrophias.

2. Numerous sympathetic dystrophias are seen following injury. These are manifested as paresis, rarefaction of the bone, muscular atrophy or sclerosis and cessation of the growth of the whole limb. Ischæmic contraction, another sympathetic condition, is treated by simple denudation of the vascular sheaths.

3. The necessity for the revision of the classification of other types of bone dystrophias seems to be indicated by the teachings of the pathology of the endocrine sympathetic system. W. A. BRENNAN.

## FRACTURES AND DISLOCATIONS

**Marchak: Five Fractures of the Neck of the Femur Treated by the Method of Pierre Delbet** (Cinq fractures du col du fémur traitées par la méthode de Pierre Delbet). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 305.

This report was read by Delbet who stated that he first introduced his method of treating fracture of the neck of the femur with the aid of screws eleven and one-half years ago.

There are two groups of so-called neck fractures of the femur, the first, true cervical fractures, and the second, fractures of the mass of the trochanter. Each of these groups has subvarieties.

True cervical fractures do not consolidate by a bony callus, while fractures of the mass of the trochanter consolidate as well and as quickly as diaphyseal fractures.

Formerly in France fractures of the neck of the femur were not treated directly. Attention was paid rather to the pulmonary complications which might result. The consequence was that if the fracture was entirely cervical it did not consolidate, and if cervicotrochanteric it consolidated in a very faulty position. The practice followed in America in the treatment of this condition was not much better.

In 1907 Delbet tried to improve the treatment. Lambotte's screw method was not giving satisfactory results as the head of the femur usually became necrotic.

Delbet's recent apparatus for use in cases of fracture of the femur opened up a new phase of the question. As this apparatus permitted walking while assuring apposition it appeared that the screws were unnecessary. This has been confirmed by experience as regards the treatment of fractures of the mass of the trochanter. Cervico-trochanteric fractures treated by Delbet's thigh apparatus have consolidated without deformity and with the return of function. Screws are necessary only in the cases of very fat, heavy patients.

In cases of true cervical fractures, however, consolidation is not obtained by the use of the thigh apparatus. Delbet is not able to explain this fact satisfactorily but is of the opinion that possibly the screw acts as an irritant and excites osteogenesis. Fixation of the bone fragments by wooden screws without an arthrotomy, in addition to the use of the thigh apparatus still remains, therefore, the treatment of this type of fracture.

In Marchak's five cases Delbet's technique was followed exactly. Three recent fractures were fixed with screws and two cases of pseudarthrosis were treated by grafting.

In one of the screw-fixation cases death occurred from embolism which autopsy showed could not be attributed in any way to the operation.

W. A. BRENNAN.

## SURGERY OF THE BONES, JOINTS, ETC.

**Willems, C., and De Caestecker, J.: Immediate Walking after the Removal of Mobile Foreign Bodies from the Knee; Thirteen New Cases** (La marche immédiate après l'extirpation des corps mobiles du genou. Treize nouvelles observations). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 44.

The authors recently reported 5 cases of free bodies removed from the knee in which, according



to the method devised by Willems, they prescribed immediate walking after operation.

The 13 cases reported herewith confirm the good results obtained formerly in every respect but are not as astonishing as those given by immediate active mobilization in cases of purulent arthritis.

W. A. BRENNAN.

**Cotte, G.: Treatment of Wounds of the Knee-Joint by Immediate Active Mobilization** (Traitement des plaies articulaires du genou par la mobilisation active immédiate). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 238.

Cotte has treated 17 wounds of the knee-joint by the Willem's method of immediate active mobilization.

Eleven of these patients were first operated upon from forty-eight to sixty hours after the injury. Six had already been operated upon in other services and came to Cotte's service with arthritis fully developed.

In 6 of the cases of recent injury immediate active mobilization has given the best result not only as regards arthritis but also as regards the return of the articular function. In 2 cases, however, in spite of the early and regular application of the method, a severe arthritis developed and in one case amputation was necessary.

In the other 3 cases of recent wounds in which a primary intervention was done there were bone lesions in addition to the joint injury. In 2 of these, despite immediate mobilization, resection was necessary. Both patients recovered. In the case of the third patient there was a good functional recovery.

In the 6 cases of arthritis which were treated by active mobilization a secondary resection was necessary in 4 and an amputation in 2. There were 5 recoveries. One of the patients upon whom amputation was performed died.

The author considers that these cases gave a fair trial of Willem's method as they were not selected. The results were not so good as those obtained by Willem's and Depage.

The facts show that in recent injuries of the joint immediate active mobilization almost always gives good results as in 7 out of the 11 cases recovery has been almost complete.

In wounds of the joint in which arthritis has developed, however, failure by the method has been general.

The failures may perhaps be explained by the length of time that elapsed between the injury, the first operation, and the mobilization, but whatever the cause, active mobilization did not cure the arthritis and in fact may have had an unfavorable effect upon it.

The author therefore concludes that in cases of arthritis with associated bone lesions due to war injuries an early secondary resection is best. Active mobilization after several day's time is not

to be recommended in the cases of patients upon whom arthrotomies have been performed.

W. A. BRENNAN.

**Thompson, J. E.: Anatomical Methods of Approach in Operations on the Long Bones of the Extremities.** *Ann. Surg.*, Phila., 1918, lxviii, 309.

The men who have left the greatest impress on scientific surgery have achieved their success through contributions to anatomical improvements in technique and additions to our knowledge of surgical pathology.

It is pointed out that while wonderfully good surgery is performed on the abdominal viscera, and in some instances an unusual degree of skill is shown in operations on the neck, the work done on the arms and legs, is with few exceptions not of the highest order. This deplorable condition is attributed partly to the surgeon's lack of practice and partly to his deficient training in anatomy.

The author has made an extensive study of the long bones and the best routes by which they can be reached, summing up the results of this study as follows:

The best routes to expose the tibia are:

1. Along the line of its subcutaneous surface from the medial tuberosity proximally to the tip of the medial malleolus distally. This is the route of choice.
2. Along the line of the medial border of the tendo achillis and the flexor pollicis longus to expose the posterior surface of the distal end of the shaft for tendon implantation and fixation.
3. Along the line of the lateral border of the tibialis anterior to expose the anterior surface of the distal end of the shaft for tendon implantation and fixation.

To expose the fibula, the best routes are:

1. Along the line of the subcutaneous surface of the lower fourth of the shaft and the lateral malleolus.
2. Along the posterior peroneal septum for the upper three-quarters of the shaft.

For the exposure of the femur, the author recommends the following routes:

1. Vertically upward from either lateral or medial epicondyle for the lower epiphysis and the lower quarter of the shaft.
2. An anterolateral incision lateral to the rectus femoris for a small area at the juncture of the middle and lower thirds of the shaft.
3. An external incision for the upper three-quarters of the shaft along a line drawn from the tip of the trochanter major to the outer border of the patella.
4. Between the vastus lateralis in front and the short head of the biceps cruris and the insertion of the glutæus maximus behind, along a line extending from the posterior border of the great trochanter proximally to the posterior border of the lateral condyle distally.

5. Along the line of a medial incision extending vertically upward from the abductor tubercle, to expose the posterior surface of the lower fourth of the shaft (popliteal surface).

6. The anterior oblique incision lateral to the line of the upper end of the sartorius muscle for the exposure of the hip-joint, the neck of the femur and the upper part of the shaft.

**Heitz-Boyer: Twenty-Five Cases of Massive Bone Grafts** (A propos de 24 cas de greffes osseuses massives). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 88.

Ten of these bone grafts were done in cases of pseudarthrosis without bone loss and 15 in cases with loss of substance ranging from 2 to 11 cms. Eight cases were aseptic and 17 septic.

Of the aseptic cases 4 were without loss of substance and gave 4 recoveries. In the 4 cases with loss of substance there were 2 perfect recoveries, 1 failure, and 1 case of fracture of the graft.

In the 17 septic cases, there were 12 successes, 1 failure, and 1 doubtful result. In 3 cases the results are not yet complete.

In 20 of the cases in which the graft was inserted more than a year ago it has become more or less completely eliminated in 11. In spite of the elimination, Heitz-Boyer obtained recovery from the pseudarthrosis and bone regeneration sometimes reaching

5 cms. in 10 of these cases. The eliminated graft was partly eaten away and some parts had completely disappeared.

The results obtained in cases in which there was suppuration were almost as successful as those obtained in cases without suppuration, showing that a bone graft may "take" almost as well in a slightly infected area as in an aseptic area.

A second finding was that a graft of dead bone provokes reparative osteogenesis almost like that caused by a graft of living bone, and such repair-osteogenesis can be obtained even when the graft is eliminated provided the elimination does not occur too soon.

The experience gained during the war, therefore, has established the fact that grafts of dead tissue are as efficient as grafts of living tissue, and that in the adult it is the bone tissue itself rather than the periosteum which forms the reparative bone tissue.

The graft constitutes a passive reserve agent from which calcium can be drawn for the repair processes. The action is mostly indirect, and as regards the graft is mechanical, irritative, and chemical. The author discusses these points at length, and arrives at the conclusion that from the viewpoint of practical surgery the use of grafts of dead bone is preferable to the use of grafts of living bone.

W. A. BRENNAN.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Elsberg, C. A.: On Some Lesions Observed in Operation for Old Injuries to the Spinal Cord, with Remarks as to Treatment.** *Ann. Surg.*, 1919, lxi, 239.

There are but few cases of injury to the spinal cord which will require operative interference months after the initial trauma. The definite indications for operation the author sums up succinctly. In order to arrive at the proper conclusions thorough and repeated neurologic examinations and the use of good X-ray plates are very necessary.

Even if the reflexes have returned and spasticity is marked, surgical relief is impossible if the symptoms of a complete transverse lesion have existed from the time of the trauma. Neither has the author ever seen improvement after operative interference upon patients with symptoms of incomplete cord lesions who had large bed sores and were much emaciated.

Those who have improved considerably for a period of months but in whom the improvement

has stopped before the useful function of the limbs has been regained should be operated upon if either a marked angulation of the cord has remained or the X-ray shows a narrowing of the spinal canal by dislocated or newly formed bone and unless the examination shows that there is a dissociated disturbance of superficial sensation. If there has been considerable return of the power in the lower limbs and the condition has become stationary, and if locomotion is interfered with by the spasticity, a laminectomy and division of the appropriate posterior nerve roots is often followed by very satisfactory results. If severe root pains at or near the upper level of the lesion cannot be relieved by immobilization of the spine, a wide decompression laminectomy with division of the posterior nerve roots should be done.

The author has performed 20 operations for old fractures or wounds of the vertebral column. Eight patients were relieved completely and the condition of 6 of them was greatly improved.

GATEWOOD.



## SURGERY OF THE NERVOUS SYSTEM

**Cone, S. M.: Some Practical Applications of Pathology to the War Injuries of Nerves.** *J. Orthop. Surg.*, 1919, i, 157.

Macroscopically at the operating table note should be taken systematically of the size, shape, location, color, circumscription or infiltration, consistency, translucency, and homogeneity of the injured tissue. Protoplasm (cells) *en masse* is translucent, gelatinous, gray, more or less cedematous and bulging. When compact, it is gray and opaque. Fat is yellow; muscle, red; arterial circulation, pink; venous congestion, blue; and broken-down blood, brown. Fibrous tissue is hard to tear, grates on cutting, and may be separated readily from its surroundings only when it is circumscribed or beginning to retract. When dense, it cups on section and retracts about softer and more cellular tissue.

The author continues in this terse fashion to describe the gross and microscopic findings the surgical indications, and the prognosis. The article

is the last word on the pathology of war injuries of the nerves. L. C. DONNELLY.

**Jones, A. R.: Tendon Fixation in Irrecoverable Musculospiral Paralysis.** *J. Orthop. Surg.*, 1919, i, 135.

With his description of the deformity of the hand caused by musculospiral paralysis the author briefly describes also tendon fixation, its history, and the various methods of applying it. The treatment of musculospiral paralysis consists in converting the extensor radialis longior, brevior and carpi ulnaris into ligaments.

The typical Galli operation is performed, the tendons being buried in scarified grooves of the bone over which periosteum is then sewed. After the operation the hand is held in a slightly dorsiflexed position for two or three months and no active motion is permitted for at least six weeks or more. Case reports are given with photographs showing good functional results. C. C. CHATTERTON.

## MISCELLANEOUS

## CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESES, ETC.

**Alexander, M. E., and Follett, E. C.: Subcutaneous Emphysema, with the Report of Several Cases, Particularly One with Very Extensive Generalized Emphysema.** *J. Am. M. Ass.*, 1919, lxxii, 930.

Congenital emphysema is very rare. Emphysema in infants as the result of rupture of pulmonary vesicles following violent exertion or a fit of coughing has been observed by various authors. Traumatic emphysema of external origin may result from stab wounds. Puncture wounds, even those produced by an ordinary, medium-sized exploratory needle, have also been known to produce severe emphysema. In regard to traumatic emphysema of internal origin, the author states that cases have been described in which the condition was due to rupture of almost any part of the alimentary canal, as for example the œsophagus, the stomach, or the rectum. What is true of the alimentary canal is true of the air passages. The rupture of almost any part may produce emphysema, as for example rupture of the nose and accessory sinuses, the larynx, the trachea and bronchi, or the lungs.

Emphysema of the tissues surrounding an abdominal wound after laparotomy is a rather curious manifestation, but cases have been recorded from time to time. By the term "spontaneous emphysema" is meant the occurrence of emphysema after extensive subcutaneous extravasation of blood. Emphysema during labor is not very frequent. Usually it occurs in the second stage of labor, during the pe-

riod of expulsion, when, owing to the excessive straining, pulmonary vesicles are ruptured.

In reviewing the literature, reports of a considerable number of cases of generalized emphysema are found. The exact distribution of the emphysema varies in different cases and depends on the extent of adherence of the skin to the subjacent structures.

The complications of emphysema are: (1) extension to the mediastinum; (2) extension to the internal organs; (3) hæmopneumothorax and pyopneumothorax; and (4) erysipelas and cellulitis.

Generally speaking, the prognosis is good, but depends on the origin of the condition and its complications. The accepted opinion seems to be that subcutaneous emphysema requires no special treatment beyond that of the condition causing it.

H. H. FREILICH.

**Lewis, J. H.: Slow Intravenous Injection of Antiserum to Prevent Acute Anaphylactic Shock.** *J. Am. M. Ass.*, 1919, lxxii, 329.

After a thorough review of the literature dealing with anaphylactic shock in serum treatment, and an experimental study with dogs, rabbits and guinea-pigs, the author has arrived at the following conclusions:

Acute anaphylactic shock can be prevented in sensitized experimental animals by giving otherwise fatal doses of diluted antigen intravenously at a very slow rate.

So far as these results can be applied to man, it is to be recommended that when immune serum must be given intravenously, it should be injected slowly



and in dilute form. The exact quantitative relation must be worked out experimentally with the patient. At present it can be said only that the injections should be given as slowly, and the dilutions should be as high, as is convenient or necessary under given conditions.

H. J. VAN DEN BERG.

### SERA, VACCINES, AND FERMENTS

**Casaubon, A.: The Comparative Value of the von Pirquet and Mantoux Reactions in Established Tuberculosis** (Sobre las reacciones de von Pirquet y de Mantoux; su valor comparado en los tuberculosos averiguados). *Rev. Asoc. méd. argent.*, 1919, xxx, 34.

The author sums up his conclusions as follows:

1. The intradermal reaction of Mantoux is more trustworthy than the cutireaction of von Pirquet in all types of tuberculous infection, active, latent, or cured.

2. The dosage in the von Pirquet test is 1 drop of pure tuberculin. In the Mantoux test the dose ought to be 0.1 cc. of a solution of 1:1000 of the same tuberculin instead of .01 mg. as proposed by the authors, and even 0.1 cc. of a solution of 1:100 in the case of those who did not react or gave only a doubtful reaction in two or three previous attempts with the first dose.

3. Except for a slight and transitory elevation in temperature the doses indicated do not cause any disturbance whether the tuberculosis is active or latent or the patient is a child or an adult. The investigations of Combe and Jeanneret have shown also that they cause no disturbance even in the infant. The ulcerous reaction produced by the Mantoux test may be produced also by the von Pirquet test.

4. Greater technical difficulties are offered by the Mantoux test but it has the advantage of greater accuracy.

5. The high percentage of positive results obtained by the von Pirquet test in the case of those who are infected with tuberculosis and the very great simplicity of its technique and materials makes it particularly acceptable, however, under certain conditions. When possible, use should be made of both tests.

6. Positive reactions to tuberculin are dependent upon the presence of antibodies. As these may be absent, either permanently or temporarily in persons infected with tuberculosis, the tests should be repeated at different times before it is asserted that the subject is free from infection.

W. A. BRENNAN.

### BLOOD

**Delrez, L.: Sanguinary Effusions of the Serous Cavities** (Les épanchements sanguins des cavités séreuses). *Arch. méd. belges*, 1918, lxxii, 602.

For a long time it has been generally believed that blood extravasated into serous cavities does

not coagulate. This theory, however, is not founded upon correct observation.

Recent animal experimentation by Delrez showed that when extravasated blood was removed by puncture from a serous cavity it did not coagulate in vitro; that when the cavity was opened either immediately or within some hours after the extravasation, clots always were found; that the proportion of defibrinated blood was always very high in comparison with the clots; and that in animals the absorption of blood effused in serous cavities is always very rapid.

These results obtained experimentally in animals are entirely in accord with what might be assumed. Blood extravasated into the serous cavities coagulates by the formation of gelatinous clots resembling coagulation in vitro. It resembles defibrinated blood because of the abundance of serum. In hæmothorax the condition is due at least in part to the churning caused by the movements of the diaphragm, and in hæmoperitoneum by the movements of the abdominal viscera.

There can be no doubt but that in pleural or peritoneal extravasation in man the blood undergoes coagulation. Intra-articular coagulation has been demonstrated by arthrotomies. No indication as to what becomes of the products of these coagulations is given by animal experiments as in the latter absorption is rapid while in man it is extremely slow.

On applying the findings of the experiments reported to practical surgery it is evident that puncture of extravasated blood by the needle or syringe is futile inasmuch as the clots and fibrin escape it. A more radical method of evacuation is therefore indicated. The area of such effusions should be opened with the scalpel, the opening being made large enough (8 to 10 mm.) to permit the easy passage of clots. Rigorous asepsis is required but otherwise this method is simple. W. A. BRENNAN.

**Mandlebaum, F. S.: Two Cases of Gaucher's Disease in Adults; a Study of the Histopathology, Biology, and Chemical Findings.** *Am. J. M. Sc.*, 1919, clvii, 366.

Only 16 cases of Gaucher's disease in which the diagnosis was established by histologic examination had been recorded up to the year 1916, and since that time the reports of only 2 authentic cases have been published. The writer presents 2 additional cases in detail, giving the histologic and chemical findings and attempting to establish the disease on a firm anatomic basis. He discusses also some disputed questions relating to the histogenesis of the large cells in the hæmatopoietic organs and the chemical nature of the substance in the cells.

The disease begins usually in infancy or childhood and is characterized clinically by progressive enlargement of the spleen and subsequently of the liver, a discoloration of the skin of the exposed parts of the body, a peculiar thickening of the conjunctivæ, hæmorrhages such as epistaxis or bleeding from the gums, and a definite leucopenia. The



superficial lymph nodes are not enlarged, there is no jaundice, and ascites is rare. The condition is distinctly chronic.

The organs involved are the spleen, liver, lymph nodes, and bone-marrow. The presence in these organs of peculiar large cells with a characteristic cytoplasm not exactly duplicated in any other disease is a distinguishing histologic feature. These cells are derived from the reticulum of the hæmatopoietic structures. That they may originate also from the endothelial cells of the venous sinuses of the spleen cannot be denied. Fat or lipid bodies cannot be found in the large cells by microchemical or polariscopic tests. On chemica analysis it is found that the peculiar substance in the large cells does not belong to the extractive group, but is apparently a complex protein in combination with lipoids.

Gaucher's disease is evidently caused by some disturbance of metabolism the products of which are contained in a specific group of cells (reticulo-endothelial) of the hæmatopoietic system. In other diseases and in some lesions produced experimentally in animals, the presence of large cells in the same specific group may be noted. This group may react in various ways to chemical, bacterial, metabolic or toxic irritation, but the changes in each instance are dependent on the etiologic factor and a clear distinction between the reactions of these cells and the large cells of Gaucher's disease may be made by microchemical and histologic examination.

H. H. FREILICH.

**Kahn, M., and Barsky, J.: Studies of the Chemistry of Pernicious Anæmia.** *Arch. Int. Med.*, 1919, xxiii, 334.

In an endeavor to add something to our rather sparse knowledge of the pathochemistry of pernicious anæmia Kahn and Barsky conducted a series of investigations on 3 cases of the disease. These cases were as follows:

**CASE 1.** Jewish woman, 45 years old, married; no children; four miscarriages; husband well. A Wassermann test was made and twice was found to be weakly positive. When the patient came to the hospital, she had a red blood count of 720,000, hæmoglobin 35 per cent, color index 2, white blood count 6,600, neutrophils 53 per cent, eosinophils 1 per cent, large mononuclears 2 per cent, and lymphocytes 44 per cent. Marked anisocytosis and poikilocytosis. Coagulation time, 12.5 min.; blood platelets, 150,000. The patient remained in the hospital for three months, and was given several transfusions by the citrate method. Salvarsan had no effect. During one of the remissions she left the hospital.

**CASE 2.** Married salesman; one child; ill for eight months; denied syphilis; had had gonorrhœa; Wassermann doubtful. Blood: red blood count 1,200,000; hæmoglobin 45 per cent; color index 1.8; marked anisocytosis and poikilocytosis; normoblasts present; platelets 185,000; coagulation time, 11 min.

The patient was given several transfusions, but died. No autopsy.

**CASE 3.** Married woman, aged 42; two children; ill one year. Blood: Wassermann negative; red blood count 1,400,000; hæmoglobin 42 per cent; color index 1.3; blood platelets 210,000; coagulation time 13.5 min.; white blood count 7,200; polynuclears 62 per cent; many normoblasts. The patient was given several transfusions and left the hospital during a remission.

The investigations included examination of the blood, a study of the functional capacity of the gastro-intestinal tract, a study of the function of the pancreas, examination of the urine and a study of the liver and kidney function. The results were summarized as follows:

1. The blood shows a lessened specific gravity of the serum, reduction of the protein content, an increase in the ash and lime content, and a normal fat, cholesterol and glucose percentage.

2. There is complete anacidity in the stomach, an increased residuum, and absence of pepsin, the picture resembling that of carcinoma ventriculi.

3. The Wolff-Junghans test is negative.

4. Intestinal digestion is disturbed. The fæcal bulk is much increased, and the nitrogen lost in the fæces above normal. The fat in the fæces is normal.

5. Intestinal putrefaction, as evidenced by increased ethereal sulphate output, is present. There is a state of suboxidation—the neutral sulphur fraction is increased.

6. The pancreas functionates normally as evidenced by enzyme examination of the duodenal contents and fæces.

7. There is a deficiency in the hepatic detoxication function as shown by the sulphoconjugation test. The glycogenic and ureogenic functions of the liver are normal.

8. The excessive hæmolysis is attended by both a pleochromia and a urobilinocholia. In this regard Schneider's experiments are corroborated.

9. There is an increased elimination of oxyproteic acid nitrogen in the urine; the other urinary nitrogen fractions are normal.

10. The renal function is normal as evidenced by the phenolsulphonephthalein test and the blood-nitrogen partition.

11. The creatinin in the blood is increased.

12. Acidosis is present as determined by the carbon-dioxid combining power of the blood plasma, the H-ion concentration of the blood, and the carbon dioxid of the alveolar air.

G. W. HOCHREIN.

**Goormaghtigh, N.: Arrest of Kidney Function Following Blood Transfusion** (Note sur un cas de blocage du rein consécutif à la transfusion du sang). *Arch. méd. belges*, 1918, lxxii, 611.

In the case of a wounded soldier treated by a transfusion of blood from a healthy donor a decrease in the kidney function was observed the following day. The man died. The autopsy findings showed the picture of a grave toxæmia and the



presence of lesions of a toxic nature in the liver and the heart. The blood plasma of the donor appeared to have acted as a toxin.

The symptoms of failure in the kidney function following transfusion are marked oliguria which begins early and develops into anuria, a gradual increase in the arterial pressure associated with slowing of the pulse, an antitoxin reaction of the organism, and marasmus, i.e., the clinical picture of uræmia.

Two questions are suggested: What was the cause of the kidney block, and under what circumstances may the blood of a donor act as a toxin? In answer to the first, the author states that the renal condition probably had its origin in the liver which is able to secrete substances, like urea, with an effect upon the renal function. Anuria is a frequent symptom in severe hepatites. The answer to the second question calls for further research.

W. A. BRENNAN.

### BLOOD AND LYMPH VESSELS

**Guéniot, P.: The Value of Distant Arterial Ligation in the Treatment of Hæmorrhage** (Valeur des ligateurs artérielles à distance dans le traitement des hémorragies). *Bull. méd.*, Par., 1919, xxxiii, 107.

In Guéniot's opinion it is best to ligate the two ends of the bleeding vessel in the area of the wound. In deep hæmorrhage from facial wounds, however, this is not always possible. In such cases recourse must be had to ligation of the external carotid artery, the efficiency of which is now well known.

In hæmorrhages from wounds of the limbs arterial ligation at a distance from the wound is only a makeshift, an operation of necessity rather than of choice. The surgeon may be compelled to ligate in this way, for example, in cases of secondary hæmorrhage from infected wounds. In spite of all objections, however, it is in some cases an admirable means of securing hæmostasis. The arterial trunk should be tied as near as possible to the site of the lesion, above and below it.

W. A. BRENNAN.

**Rocher: Arteriovenous Aneurism of the Aorta and Vena Cava Produced by a Bullet in the Left Renal Vein** (Anévrisme artériosa-veineux aortico-cave produit par une balle de fusil logée dans la veine rénale gauche). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 12.

The autopsy on Rocher's patient showed that a bullet which had traversed the right hypochondrium had struck the lower pole of the right kidney, perforated the inferior vena cava at its external aspect, re-perforated the vena cava on the anterior aspect near its internal edge, and pierced the anterior wall of the aorta. An enormous diffuse aneurismal hæmatoma had resulted. The subsequent heart, lung, kidney, and other disturbances caused death within three months. A diagnosis of aneurism had not been made.

Arteriovenous communications of the aorta and

superior vena cava more frequently originate from an arterial lesion of pathologic order than from a traumatism. They are usually situated in the ascending portion of the arch of the aorta and the vena cava.

Arteriovenous aneurisms of the inferior vena cava usually result from a traumatism in the form of a violent abdominal contusion.

Although in aneurism of the aorta and the inferior vena cava there is a pulsating tumor in the abdomen, an arteriovenous aneurism has been diagnosed only once in the cases recorded in the literature. In no recorded case has any surgical operation been attempted. The author believes, however, that in traumatic cases separation of the vessels and suture is quite feasible.

W. A. BRENNAN.

**Grégoire, R.: Arteriovenous Aneurisms and Arterial Suture** (Aneurismes artérioveineux et suture artérielle). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 407.

The ideal treatment of arteriovenous aneurisms is unquestionably a treatment which closes the arteriovenous communication while preserving the physiologic integrity of the vessels. Such an ideal operation is rare for in 91 cases of arteriovenous aneurism reported to the Société de Chirurgie during the past four years it was performed only 9 times. Quadruple ligation and extirpation which is the usual procedure often leave distressing sequelæ such as ischæmia and gangrene of the limb.

In a great many instances it is quite feasible to re-establish the blood current and this might have been done in many cases in which the operation performed was quadruple ligation and extirpation. In some cases, however, ligation and extirpation is the only justifiable treatment. Such are those in which the aneurism is situated at the extremity of a stump or the arterial wall is so damaged that it will not hold sutures. Also there are cases in which ligation and extirpation is the only practicable method. Such for instance are cases of jugulocarotidian aneurism situated at the base of the brain.

If an aneurism is not operated upon within the first thirty to forty days after its occurrence the presence of the sclerous sheath which forms about the vessels by infiltration renders their isolation and suture practically impossible. Dense adhesions also cause difficulty.

The question of suture is therefore confined almost practically to recent arteriovenous aneurisms. A few cases in which suture of the artery was successful are cited. The great difficulty in all operations of vascular suture is to obtain perfect hæmostasis. Temporary hæmostasis should be obtained in the wound itself by temporarily ligating the artery and not the vein above the site of the lesion.

Grégoire insists that the surgery of arteriovenous aneurisms should be more conservative. The object should always be closure of the arteriovenous communication. Quadruple ligation and extirpa-



tion ought to be reserved to cases in which, because of the situation of the aneurism, sclerous infiltration, the condition of the vascular wall, or the small size of the vessel, no other course is practicable.

W. A. BRENNAN.

**Filadoro, P.: Two Cases of Popliteal Aneurisms of Syphilitic Nature** (Due casi di aneurisma della poplitea di natura sifilitica). *Policlin.*, Roma, 1919, xxvi, sez. chir., 32.

In one of these cases the aneurism was of great size. When specific treatment, which was continued for some time, failed to give any benefit, operation was performed. In the other case the aneurism was small and under intense specific treatment the patient recovered without operation.

Filadoro believes that the prognosis in ectatic forms of arteritis in the trunk vessels of the limb is very favorable. When such an aneurism is found to be due to syphilis, the patient should be subjected to rigorous specific treatment. In certain well-defined cases of aneurism, especially when the lesion is small, such specific treatment, if begun early, may in a short time cause the disappearance of all subjective symptoms. Very large aneurisms require surgical intervention.

W. A. BRENNAN.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Senger, W.: The Modern Treatment of Burns.** *Am. J. Surg.*, 1919, xxxiii, 29.

The writer uses paraffin in treating all superficial burns, irrespective of their extent or location. He uses it also for third degree burns if they are not large. This treatment he believes has the following advantages: (1) It immobilizes the wound; (2) protects granulations; (3) stimulates epithelial growth; (4) greatly minimizes pain; (5) renders subsequent dressings easy and much more rapid; and (6) prevents excessive scar formation.

Third degree burns should not be treated with paraffin unless they are very small. When the burn is extensive, the parts should be rendered aseptic at the earliest moment with the Carrel-Dakin solution, after which skin should be grafted to prevent scars if possible. When necessary to combat scars, "relaxation incisions" or the "button hole operation" with modifications gives the best results.

E. B. FREILICH.

**Levin, O. L.: The Ultraviolet Rays in the Treatment of Chilblain.** *J. Am. M. Ass.*, 1919, lxxii, 855.

Ultraviolet rays were used by the author in 3 cases with gratifying results.

The first patient, who had failed to respond to routine methods, was very much relieved after the first treatment, and the trouble had almost entirely disappeared at the end of the week. There was no recurrence.

In the second case there was complete disap-

pearance of the lesions after two 10-minute exposures at a distance of 20 in. administered at intervals of a week.

In the third case the pain was very much alleviated after the first treatment, and the lesions disappeared after the third.

Chilblain is essentially an erythema which occurs in those who have poor peripheral circulation and disturbed vasomotor tone. The good results obtained with the ultraviolet rays are probably due to the direct effect they exert upon the peripheral vessels and blood stream. It is therefore suggested that these rays be used in the treatment of this condition, but not to the exclusion of other local and general measures. The author regards them of value not only in removing the lesions, but, if used sufficiently early in those who have had previous attacks, in preventing recurrence.

H. J. VAN DEN BERG.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Houssay, G. L. Y., and Giusti, L.: Bilateral Vagotomy in Guinea-Pigs** (La vagotomía bilateral en los cobayos). *Rev. Asoc. méd. argent.*, 1919, xxx, 165.

Experiments were carried out by the authors in which a vagotomy was performed on more than 90 guinea-pigs and a number of white rats. The operation was either unilateral or bilateral. When bilateral, it was performed in one or in two stages. From the results the authors draw the following conclusions:

1. In guinea-pigs double vagotomy causes death in from one to five hours even when a tracheotomy is performed previously.

2. Unilateral vagotomy produces few symptoms and is always well borne.

3. Bilateral vagotomy in two stages causes death and the same symptoms as when it is performed in one stage.

4. Double vagotomy produces instantaneous, intense, progressive, and fatal dyspnoea.

5. The dyspnoea is probably due to failure of the peripheral stimuli which are indispensable and usually proceed from the vagus to the respiratory centers.

6. Double vagotomy when performed on the white rat in either one or two stages produces death in the same way as in guinea-pigs.

W. A. BRENNAN.

**Ely, L. W.: The Formation of Bone.** *Ann. Surg.*, 1919, lxi, 225.

In an effort to avoid some of the mistakes which he believes are being made by those attempting to determine the origin of new bone, the author begins by laying down exact definitions of bone cortex, marrow, and periosteum. "Bone cortex" is the layer of compact bone tissue at the surface of all bones. It is perforated by channels for the entrance of blood-vessels and contains the longi-



tudinal Haversian systems, prolongations of the periosteum, and marrow. "Marrow" is all the soft tissue within the bone. It is generally described as being lymphoid, fatty, or "myxomatous," but its situation, not its composition, determines its name. "Periosteum" is the tissue which covers all bone except at the joint surfaces.

Intracartilaginous bone begins with the pushing-in of blood-vessels into the cylinder of cartilage about which calcification and ossification take place. In other words, this is bone formation without marrow or periosteum. Other examples might be cited such as the bone formation in the walls of the aorta, in necrotic lymph glands, and in the kidneys of laboratory animals whose renal vessels have been ligated. It appears that all that is necessary for bone formation are blood-vessels, a loose meshed, fibrous tissue, a homogeneous tissue (cartilage matrix), or a granular or necrotic material, and a stimulus. The stimulus may be physiologic or pathologic.

The derivation of the osteoblast is still uncertain. It has no physical characteristics by which it can be distinguished from other cells. In the author's opinion osteoblasts can both build up and tear down. In certain inflammatory processes in the marrow the active factor is the small cell which is not to be distinguished from the osteoblast. The fibrous tissue of the periosteum is the same as other fibrous tissue. If there are osteoblasts under it they will form bone there as well as anywhere else.

GATEWOOD.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Lyster, C. R. C., and Russ, S.: A Biological Basis for Protection Against X-Rays.** *J. Roentg. Soc.*, Lond., 1918, xiv, 87.

Lyster and Russ report a study of the amount of radiation reaching individual operators, with a view to determining how operators may be adequately protected. A small X-ray plate was wrapped in 1.5 mm. of lead in which four holes were punched. This was carried in the pocket during one full day's work, after which it was developed and compared with a standard exposure. From this comparison the fraction of an erythema dose received by the operator was estimated. The test exposures were made with Coolidge tubes and with radium bromid, the latter being preferred.

A further study was made of the biologic effect of soft and hard radiation. In each case it was arranged that the plate should be acted upon by the beams of rays which produced identical ionization in the air of a small gold-leaf electroscope.

In studies of this kind the plate carried by the operator should be of the same make as the plate used for the basis test or it will be necessary to estimate the comparative speed.

Safety from X-rays is a twofold problem: protective devices in the apparatus and precautions taken by the operator himself. In determining the

safety of an installation both factors must be considered.

In the studies reported plates were carried by twelve different operators with results varying from no exposure to an exposure equal to 3 min. of the basis test plate.

The writers offer to estimate the exposure of plates carried by operators if they are sent to them at the Middlesex Hospital. This offer arises from their conviction that even at the present time adequate steps are not always taken for protection against the X-ray. They believe it a matter of national importance that medical X-ray procedure should not come under the category of dangerous occupations.

D. R. BOWEN.

**Einhorn, M.: X-Ray Visualization of the Gut by Means of a New Intestinal Delineator.** *Med. Rec.*, 1919, xcv, 509.

The "delineator" described by Einhorn consists of about 30 feet of braided silk through the lumen of which are run sixty strands of annealed copper .002 inch in thickness. At the distal end is a small metal ball. Leaded markers indicate the length of the string from the ball in yards. The cord is run through a mouthpiece somewhat like a cigar holder and passes from a reel without any special swallowing effort by the patient. X-ray exposures are made at two-hour intervals until the ball appears in the stool.

The use of the instrument by two patients is described and the following conclusions are drawn:

The delineator passes the small intestine without curling but curls in the colon.

In the small intestine the ball always runs ahead of the string and pulls the latter along, but in the colon the string, in spiral form, is frequently seen ahead of the ball.

These normal findings will probably be of diagnostic value in pathologic conditions. In obstructions along the small intestine the forward passage of the ball will be stopped and the string will curl up.

D. R. BOWEN.

**Cheney, H. H.: The Use of X-Rays in Gastro-Intestinal Diagnosis.** *Canadian M. Ass. J.*, 1919, ix, 238.

The author briefly describes the method he employs in making gastro-intestinal examinations with the roentgen ray and his findings. Relative to oesophageal conditions, he mentions deviation associated with aortic aneurysm and cardiospasm with ulcer near the cardia or cicatricial contraction. He sums up the findings that point to ulcer under positive and possible signs. The former include the niche, perforation, pyloric obstruction with cicatricial contraction, permanent hour-glass deformity, and incisura; the latter, absence or temporary irregularity of the duodenal cap, retention, or rapid emptying. The possible signs may be of reflex origin or produced by lesions outside of the gastro-intestinal tract.



Unusually rapid emptying of the cæcum points to an enteritis or subacute appendicitis, whereas delayed emptying may indicate a cicatrix, chronic appendicitis, or neoplasm. Colonic stasis is evident in the majority of cases brought before the roentgenologist and is caused by hepatic or splenic acnity, or both, in 75 per cent of these cases.

ADOLPH HARTUNG.

**Spriggs, E. I.: The Examination of the Vermiform Appendix by the X-ray.** *Arch. Radiol. & Electrotherapy*, 1919, xxiii, 301.

A résumé of the history of the demonstration of the appendix with the aid of the roentgen ray is followed by a description of the meals given and the methods used in the examination. The appearance of the normal and diseased appendix as observed on the plate and screen is described in detail and the findings summarized.

The signs of present inflammation are, beside pain and other clinical symptoms, a tender point and varying dilatation of the lumen from hyperactivity and spasm, while evidence of former disease, recent or remote, is given by concretions, abnormal outline, delay in filling or emptying, adhesions, severe kinks, and, in certain cases at least, by the absence of a shadow.

The author's summary is as follows:

1. In the large majority of cases, it is possible to observe the appendix with the X-rays by the use of an opaque meal of buttermilk and barium sulphate after preparation with castor oil.

2. The normal appendix fills and empties about the same time as the cæcum. Especially in young persons it may fill and empty repeatedly while the cæcum remains full. The best view is usually obtained about twelve to fourteen hours after the ingestion of the opaque meal.

3. Direct X-ray examination of the appendix is of much help in the diagnosis of chronic appendicitis. With adequate observation it is found that the proportion of cases in which no barium sulphate enters the appendix is small.

4. In determining whether the appendix is or has been diseased, attention must be paid to the filling and emptying, the shape, mobility, and position, and the presence of concretions, hyperactivity spasm, or tenderness. Continued contractions and spasm are associated with active inflammation. The presence of a tender point is a valuable sign, but requires care in its interpretation.

5. In 36 cases in which the X-ray reports were compared with the operative findings, the diagnosis was verified at the operation. ADOLPH HARTUNG.

**Maucilaire: Review of Operations Performed Under Screen Control by Didier, Lapeyre, Rhabourdin, and Marcille.** *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 207.

Didier's statistics comprised 11 cases of projectiles situated in the upper and middle portions of the lung, 10 in the region of the hilum, 2 in the

pleurodiaphragmatic area, 3 in the mediastinum, and 1 fixed in the anterior wall of the left ventricle of the heart.

In every instance the extraction under screen control was easily accomplished by a limited thoracotomy. Only a few centimeters of the rib or cartilage were removed, a Tuffier retractor was applied, and the projectile searched for and removed with the forceps.

Lapeyre reported 4 similar cases treated in the same way.

Rhabourdin's statistics included 40 cases of extraction of projectiles in 3 of which the foreign body was removed from the lung.

Maucilaire himself has performed operations under screen control since 1913, on the head and elsewhere as well as on the thorax.

In the case reported by Marcille the fixation of a screw in the neck of the femur in the treatment of an old pseudarthrosis was accomplished under screen control very easily.

Maucilaire believes this method is applicable also to the reduction of subcutaneous fractures.

The most serious objection to screen control during operations is the possibility of producing radiodermatitis, but this is almost obviated by the present elaborate means of protection.

W. A. BRENNAN.

**Simpson, F. E.: Epithelioma of the Face.** *Surg. Clin. Chicago*, 1919, iii, 70.

From the standpoint of the treatment of a cancer it is most important to determine its pathologic type.

The clinical diagnosis of epithelioma of the skin is comparatively simple. A probable diagnosis can be made clinically if it is borne in mind that epitheliomata of the face, especially of the upper two-thirds and away from the mucous membranes, are usually of the basal-cell type while those of the tongue and lower lip are of the squamous-cell type. The latter frequently have a papillomatous aspect, grow rapidly, and form metastases early. The others grow very slowly and it is said that they never metastasize.

Squamous-cell cancer, if seen early, should preferably be excised *en bloc* with the draining lymphatic glands and the area then subjected to post-operative prophylactic radiations. Inoperable cases may be held in abeyance or even clinically cured in some cases by radium. In dealing with basal-cell epitheliomata, radium when properly applied is the agent of choice and produces prompt recovery with good cosmetic results.

The case is cited in detail of a patient with an epithelioma of the left lower eyelid, nose, cheek, and upper lip who was treated with 200 mg. of radium element at intervals for a total period of twenty-five hours in about eight weeks. At the end of that time the lesion was completely healed and has remained so to the date of the report.

ADOLPH HARTUNG.



**Simpson, F. E.: Cancer of Base of Tongue and Epiglottis.** *Surg. Clin. Chicago*, 1919, iii, 63.

A case of epithelioma involving the base of the tongue, median glosso-epiglottic fold, and left vallecula and diagnosed by macroscopic and microscopic examination was treated by the author with three radium needles which were inserted into the growth by means of a specially devised introducer. This introducer is described in detail. The needles were left in place for eight hours. The changes noted on subsequent examinations until complete healing had occurred about six months later are given. The patient has remained well for over a year.

ADOLPH HARTUNG.

**Simpson, F. E.: Cancer of the Tongue.** *Surg. Clin. Chicago*, 1919, iii, 67.

Cancer of the tongue offers difficulty in both diagnosis and treatment. It is frequently mistaken for a syphilitic ulcer, from which, however, it can usually be differentiated by the fact that it is single, situated at the border of the tongue, has a hard nodular raised edge, and forms metastases early in the glands of the neck.

A case is reported in this article in which the condition was in its early stages and there was no perceptible involvement of the adjacent glands. Five radium needles, each containing 12 mg. of radium element, were inserted into the borders of the growth and left in place for thirteen and one-half hours. About six weeks later the patient received fifteen hours' treatment with 125 mg. of radium element applied externally below the angle of the jaw. Two weeks thereafter, a second application of six needles inserted into the lesion was given.

Clinical recovery was followed three months later by metastasis to the submaxillary and submental glands. Five radium needles were inserted into the submaxillary mass and allowed to remain in place for five hours, and on the following day 200 mg. of radium were used over the submaxillary and submental glands for sixteen hours. In six weeks the glands had shrunk to a small and indistinct mass and the disease has remained quiescent to date, nearly a year later. In the last few months a few prophylactic radiations over the neck have been given.

ADOLPH HARTUNG.

### MILITARY SURGERY

**Bainbridge, W. S.: Report on Surgical Development of the War** *Internat. J. Surg.*, 1919, xxxii, 69.

The section dealing with joint lesions, fractures and trephination in the author's comprehensive report in the United States Naval Medical Bulletin of January, 1919, forms the subject of this article. Joint injuries are in the foreground of public attention in the period of reconstruction following the war, when the extent of permanent physical disabilities is the determining factor in the reshaping of the lives of many discharged soldiers. In all probability the treatment of joint lesions will be

profoundly modified by the lessons learned through bad experience with the methods used before and, in part, during, the war.

The practice of immobilizing joint injuries of all kinds has been charged with making cripples for life of thousands of British soldiers who might have regained the use of their limbs if treated by Willems' modern method of immediate mobilization and various forms of physical therapy. The apparently revolutionary but really well-grounded objections of Willems to prolonged immobilization were promptly appreciated by the author during his tour of inspection of military hospitals presided over by the Belgian surgeon, and on the basis of personal findings he emphasizes that this treatment of joint cases undoubtedly yields better functional results and a larger percentage of cures than the older methods.

In order to obtain the best results, the motions, which are practically painless, must be made by the patient himself, carried to the maximum and as nearly as possible continuous. These active movements must involve the muscles ordinarily used in moving the joint, and are not to be replaced by, or combined with, passive motion.

The most surprising results of all can be achieved in the treatment of purulent arthritis. In such cases Willems' simple method nearly always preserves the function of the joint.

In the discussion of fractures an account is given of the system developed by the French Army for this type of injury and joint-injuries. The report contains also numerous illustrations of extension apparatus, fracture splints, and other mechanical devices, all of which are carefully described and explained.

The last part of the article deals with the management of the difficult class of patients on whom trephinations have been performed for the removal of intracranial projectiles or for other reasons, and who, as a result, are apt to develop psychic anomalies and phobias of various kinds due to the dread of injury to the gap left in the bony skull-cap. By introducing a plate of some kind between the skin and the dura, French operators have endeavored to secure protection from pressure and relief from direct adhesion between the dura and the subcutaneous tissue. For this purpose use has been made of perforated silver plates, osteocutaneous or osteoperiosteal flaps, and best of all, cartilaginous grafts taken from the ribs. Cartilaginous grafts provide a permanent and physiologic protective covering and are preferred by Warren Woodruffe, surgeon to the Ulster Volunteer Hospital, because they are safe, simple, autoplasmic and autogenous. The author has seen a number of these cranioplastic operations and some postoperative results in the Buffon Hospital at the clinic of Chutro whose operation with rib cartilage is a modification of Gosset's method, and who had 62 uniformly successful cases. The remarkable resistance of cartilage to infection renders this tissue an ideal material for reconstructive surgery.

F. A. ROBBINS.



**Maisonnnet: Shell Wound Completely Destroying the Right Suprarenal Capsule. Rapid Appearance of an Addisonian Syndrome** (Destruction, par éclat d'obus de la capsule surrénale droite. Apparition rapide d'un syndrome addisonien). *Bull. et mém. Soc. de chir. de Par.*, 1918, xlv, 1874.

The case is reported of a soldier who received a shell injury in the right kidney and developed the syndrome of Addison's disease on the seventh day following. Death occurred two days later.

Autopsy showed the right kidney cavity to be filled with fibrin. There was an oblique tear of the lower pole of the kidney, but the hilum vessels were intact. The suprarenal capsule was completely destroyed. The left kidney was normal in appearance but hypertrophied, and its suprarenal capsule was much reduced in size.

The author states that while he has seen very many war wounds of the kidney, he has never observed the syndrome of Addison's disease in any other instance.

In discussing this report, Delbet stated that in 3 cases he had extirpated the suprarenals for hypertension, the operation being justified as a last resort on account of the patient's condition. Although there was a postoperative reduction of the pressure, all three patients rapidly succumbed.

W. A. BRENNAN.

**Durante, L.: The Streptococcus in the First Phases of the Evolution of War Wounds** (Lo streptococco nelle prime fasi della evoluzione delle ferite di guerra). *Riforma med.*, 1918, xxxiv, 1014.

In a systematic bacteriologic study of 210 war wounds it was found that 33.5 per cent harbored the streptococcus. This percentage included both severe and slight wounds.

In 72 wounds examined within 12 hours of the injury and found to be primarily infected by the streptococcus, the diplotype of coccus was present in 98 per cent, and a coccus which appeared in chains of 4 or 5 in 2 per cent. The best time to search for the streptococcus is from the tenth to the fifteenth hour after injury. Durante found it in 85 per cent of his positive cases within the tenth hour; in 9 per cent within the eighteenth hour; in 5 per cent within the forty-eighth hour.

Pure streptococcal infection of war wounds is rare. It occurred in 9.4 per cent of Durante's cases. In 20 per cent the streptococcus was associated with aerobic bacteria, in 28.6 per cent with anaerobic bacteria and in 42 per cent with aero-anaerobic bacteria.

The nature of the wound is important. Of the streptococcal infections 82 per cent occurred in cases of fracture of the limbs with extensive muscular lesions; 18 per cent, in other wounds.

In pure streptococcal infection the evolution of the wound passes after the third or fourth day to the characteristic exudative phase in which there is a copious exudation of serous hæmatic fluid with few corpuscles. This exudation is generally mixed with elements of spaleous tissue which diminish gradually as the stage of granulation is approached. This is the most characteristic clinical manifestation of pure streptococcal infection. The patient shows the modifications of facies, pulse, and respiration common to all severe pyogenic infections. The duration is never less than two weeks.

Mixed streptococcal infection is far more common. In wounds which are not surgically treated and in which devitalized muscle tissue and other conditions favor the development of anaerobic bacteria the association of the latter with the streptococcus produces gaseous infection. Eight such wounds were observed in the 210 examined.

In fracture or other wounds largely involving the muscles which are treated with extensive exeresis followed by immediate primary suture and in which the streptococcus is associated with anaerobic bacteria, gaseous infections are almost always attenuated and limited to abscesses and inflammation. Of 64 wounds bacteriologically examined and so treated, these conditions developed in 4.

In wounds of small extent involving the soft parts, or in supra- or subdural cranial wounds, the association of the streptococcus with gaseous anaerobic bacteria never results in gaseous infections but is the cause of gangrene.

In the war wounds examined by Durante there was no case of gaseous infection in which the streptococcus was not associated with anaerobic bacteria. This is in accordance with the findings of Wright and other investigators.

W. A. BRENNAN.

# GYNECOLOGY

## UTERUS

**Thorek, M.: Absence of Uterus** (Absence d'uterus). *Ann. de gynéc. et d'obst.*, Par., 1918, lxxii, 294.

Thorek reports a case of absence of the uterus in a woman 23 years of age who had been married for two years. She had never menstruated. Complaint was made of dragging pains in the lower abdomen and hypogastric cramps. The physical examination showed the general appearance and external genitalia to be normal. Bimanual examination revealed sensitiveness in the region of the right ovary and the absence of a cervix in the vaginal dome. Diagnosis: Possible absence of uterus; adnexal tumor with pelvic adhesions. Laparotomy showed the total absence of the uterus, both tubes, and the broad and round ligaments. The pelvic floor was covered by the peritoneum, a reflected fold of which contained one ovary somewhat enlarged and cystic. The latter was resected. Microscopically the resected part was fibrous and showed no trace of uterine tissue. Recovery from the laparotomy was normal.

The condition in the case reported appeared to the author to be due to deficient embryologic evolution. He reviews the literature since the anomaly was first described by Realdus Columbus in 1572. About 400 cases have been recorded many of which, however, he believes were undoubtedly cases of hermaphroditism.

W. A. BRENNAN.

**Bonifield, C. L.: The Undeveloped Uterus.** N. Y. *St. J. Med.*, 1919, xix, 40.

The author classifies undeveloped uteri as follows:

1. The rudimentary type of uterus due to arrested development during foetal life.
2. The infantile type of uterus due to arrested development during infancy.
3. The pubescent or undeveloped uterus due to arrested development at the time of puberty.

This paper deals only with the third type.

The pubescent uterus is comparatively common, but not generally differentiated from the infantile uterus and the normal uterus.

The author divides women with undeveloped uteri into three types: (1) The very small, frail, thin woman, who is almost a dwarf; (2) the normal sized woman, possibly taller, but thin, with no "feminine beauty" to her development; and (3) the large robust woman of masculine build.

In the first type a disturbance in the endocrine system, he believes, is the sole cause of the arrest in development. While also in the second and third types, the cause may be due to faulty endocrine secretion, certain infections and constitutional diseases play a most important rôle in the etiology.

In the third type the masculine characteristics crop out and coincidentally an undeveloped uterus is always present.

Dysmenorrhœa is the most prominent symptom and is the one complaint given to the physician. Menstruation is also often scanty and irregular. In the married, sterility is common.

In treatment, prophylaxis is always the best. The proper time to treat lack of development of the uterus is in early, rather than late, adolescence. Dietetic and hygienic treatment for young girls at puberty is certainly most efficacious. Coupled with this, the administration of thyroid extract, pituitary and ovarian glands is a very important adjuvant. In extreme cases operation may be necessary, but every other measure should be tried first.

In conclusion, the author urges the family physician, who is naturally the first to see these cases, to guard the welfare of his patients during adolescence more carefully.

H. B. MATTHEWS.

**McArthur, A. N.: A New Operation for Procidentia Uteri in the Old.** *Med. J. Australia*, 1919, i, 149.

McArthur strips off an elliptical portion of the posterior and anterior vaginal walls and then joins the denuded portions. This operation is done only in the aged with complete procidentia when the use of the stem pessary is the only alternative. He claims that by this procedure there is no possibility of prolapse of the vagina. The method is more rapid than excision of the vagina, there is no interference with cervical discharge, the mucous membrane peels off readily, surgical shock is slight, and the patient is comfortable afterward.

W. F. HEWITT.

**Dixon, A. F.: The Special Supports of the Uterus.** *Med. Press & Circ.*, 1919, cvii, 237.

The special supports of the uterus are in the subperitoneal tissue and are applied at the lateral aspect of the cervix and lateral fornix of the vagina. Here the subperitoneal tissue is packed with smooth muscle and connective-tissue fibers which radiate outward with the numerous vessels and nerves. This dense mass is continuous with the muscular wall of the cervix and vaginal wall. In front of them it is continuous in the muscular wall of the lateral angle of the bladder and forms the ureteral sheath. The term "parametrium" is therefore, not inclusive. When these continuous muscle bundles are traced away from their attachments to the uterus and vagina they are found to radiate.

In considering how these supports act in holding the uterus, we must remember they are parts of the uterine and vaginal walls. Therefore they are active, not passive, and support is due to the bundle of smooth muscle fibers.

W. F. HEWITT.



**Judd, A. M.: The Cure of Prolapse of the Uterus.** *Am. J. Obst.*, N. Y., 1919, lxxix, 217.

Having tried many methods with only moderate success, the writer undertook a careful study of the procedures used by him during a period of twenty years. After the employment during the past five years of the Sims-Emmett-Baldwin combined method on 70 cases in which he obtained uniformly good results, he concludes that he can practically guarantee a cure to any patient suffering from uterine prolapse. In the case of those who are near or past the childbearing age any procedure for the cure of this condition which requires opening of the abdomen from above is unnecessary surgery.

EDWARD L. CORNELL.

**Chenhall, W. T.: Shortening of the Uterine Ligaments in Retroversion of the Gravid Uterus; Fifth Successful Case.** *Med. Press & Circ.*, 1919, cvii, 241.

The patient, who had retroversion with prolapse of the uterus and a relaxed vaginal outlet, had been pregnant for two months. A perineorrhaphy and modified Alexander operation were performed, care being taken not to handle the uterus. After operation, morphin was given to control the pain. The patient ultimately gave birth normally to a child weighing 9¼ pounds. When examined two weeks later, the outlet was found to be intact and the recti were in position.

W. F. HEWITT.

**Scott, J. R.: Tuberculosis of the Uterus.** *California State J. Med.*, 1919, xvii, 52.

The author summarizes this article as follows:

1. Tuberculosis of the uterine mucosa occurs much more commonly than would be suspected from a perusal of current medical literature.

2. It occurs at all age periods, but is most common in the decade between the ages of 20 and 29 years.

3. The symptoms are disturbances of menstruation, especially metrorrhagia and dysmenorrhœa, a feeling of weight in the pelvis, progressive constipation, painful defecation, and pain radiating from the hypogastrium to the lumbar region, to the upper thorax, and along the perineum.

4. The differential diagnosis must be made between carcinoma, chronic endometritis, and syphilis of the uterus.

5. The primary form of the disease is comparatively rare, most cases being secondary to the disease elsewhere in the body.

6. It occurs in four main types, ulcerative, miliary, interstitial and peritoneal. Of these types, the ulcerative is found most frequently.

7. The prognosis is extremely unfavorable in all except the rare primary cases.

8. The treatment in the secondary cases must be symptomatic and supportive. In the primary cases, curettage of the uterus will result in a cure if the disease has not invaded the fallopian tubes. If the tubes are involved, hysterectomy must be the

operation of choice. Operative procedures on the uterus when it is the seat of secondary tuberculosis, are harmful and are positively contra-indicated.

**Mac Carty, W. C., and Blackman, R. H.: The Frequency of Adenomyoma of the Uterus.** *Ann. Surg.*, Phila., 1919, lxix, 135.

Between 1906 and 1918, 3,388 fibromyomatous uteri were removed at the Mayo Clinic. Of these, 6.45 per cent contained adenomyomata. In 5 cases the tumor was in the fallopian tubes. The last 109 cases were studied with reference to certain clinical features which might be intimately associated with the condition. Ninety-five patients were married; 41 per cent gave histories of miscarriages; 50 per cent suffered from profuse and prolonged uterine bleeding; and 31 per cent from irregular bleeding. Sixty-five per cent of the married women had borne living children. In 5.5 per cent of the cases an associated condition was epithelioma of the cervix or carcinoma of the body of the uterus, neither of which bore any apparent relationship to the adenomata. In 72 per cent other pathologic pelvic conditions were present, such as ovarian cysts, chronic or acute salpingitis, uterine or cervical polypi, cystic cervicitis or prolapsus uteri. In no instance was a clinical diagnosis of malignancy made when malignancy was not present, and in every case the clinical diagnosis before operation was fibromyoma or pelvic tumor rather than adenomyoma.

G. W. HOCHREIN.

**Broun, L.: A Review of the Uterine Myomata Operated on at the Woman's Hospital During 1918, Comprising 262 Cases.** *Am. J. Obst.*, 1919, lxxix, 333.

During 1918, 262 patients were operated upon for uterine myomata. Four patients died, a mortality of 1.52 per cent. Two deaths were due to embolus and one to intestinal obstruction occurring eight days after myomectomy with ventral suspension and removal of tuberculous appendages. The fourth death followed within three days after a supravaginal hysterectomy and removal of purulent uterine appendages.

The 2 deaths from embolus in the present series of 260 cases in addition to 7 deaths from the same cause among 1,500 patients operated upon during the eight years previous (in which series the total number of deaths from all causes was 28), gives embolus as the largest causative factor in the fatal terminations. The next highest cause was peritonitis to which 7 deaths were due.

In the author's opinion, the fact that embolus was the causative factor in 28 per cent of the fatal cases in 1,760 operations, one-half of 1 per cent of the entire number in which operation was performed, accentuates the theory that myocardial changes may be associated with the presence and growth of myomatous tumors of the uterus.

The recoveries of 10 of the 262 patients were impaired by some complication. Two of these patients



were not discharged until thirty days after the operation on account of severe colon bacillus infection of the kidneys. One had a vesicovaginal fistula from an ununited injury of the bladder. One developed a severe bronchitis immediately after operation which resulted in the re-opening of the wound when the skin sutures were removed on the eighth day. Six developed mural abscesses in the abdominal wound which in most cases, however, were of superficial character.

In 40 cases cysts of the corpus luteum were present in addition. These varied in size from a few cubic centimeters' capacity to that of a half liter or more. Hæmorrhagic cysts were also not uncommon, there being 17 in the 262 cases of myomata. Twenty patients had chronic salpingitis and 16, hydrosalpinx.

Other pathologic ovarian conditions associated with the myomata were dermoid cysts, 4; serous cysts, 7; parovarian cysts, 2; pseudomucinous cysts, 1; adenocystoma, 3; papillomatous cysts, 2; and carcinoma of the ovary of a papillary, glandular type, 2.

In addition to the case of chronic salpingitis and hydrosalpinx mentioned there were the following associated tubal involvements: purulent salpingitis, 2; tuberculous salpingitis, 4; hæmatosalpinx, 4; and gonorrhœal salpingitis, 1.

In the myomatous tumors removed at the Woman's Hospital during the last nine years, it was found that 90 (5.1 per cent) of the tumors were undergoing necrotic changes. In some instances this condition was diagnosed previous to opening the abdomen but in the majority was not suspected. The same may be said of calcareous changes of the myomata which were found in 25 cases (1.5 per cent). Carcinoma was present in 25 cases (1.5 per cent).

The X-ray and radium should be used in myomata only to control bleeding and then only when the contents of the pelvis can be clearly mapped out. Under such conditions they are of value and by their use what would otherwise be a mutilating operation can be avoided.

No sarcomatous changes occurred in the series of the past year. Among the 1,500 operations of the eight years previous there were 7 cases, this making a little less than 0.4 per cent for nine years.

In 4 cases there were adenomyomata of the uterus, and in 9, adenomyometritis. EDWARD L. CORNELL.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Bovée, J. W.:** Tubal and Ovarian Hæmorrhage; Its Etiological Relation to Pelvic Hæmatocele and Extra-Uterine Pregnancy. *Surg., Gynec. & Obst.*, 1919, xxviii, 117.

Cases are reported which are illustrative of tubal and ovarian hæmorrhages not due to pregnancy. Such hæmorrhages occur in infancy and after the menopause but more commonly at puberty and a little less frequently later in the child-bearing period.

In the tubal variety the causes are not always clear, but inflammations and trauma seem to be the most common. Tubal ruptures from severe exercise have often been found at operation.

In ovarian hæmorrhages the escaping blood may be confined in the ovary, forming one or multiple hæmatomata which may remain separate or coalesce, or it may escape into the peritoneal cavity, forming a hæmatocele in the pelvis the size of which depends upon the amount and rapidity of the blood loss. The hæmorrhage may be into the stroma or into the follicle. The stroma variety is commonly preceded by an infection in the ovary. The resulting chronic ovaritis is characterized by the development of connective tissue which probably increases the proportion of atretic follicles. Later fatty degeneration of the blood vessel walls leads to their rupture at the time of menstrual congestion — the time of most ovarian hæmorrhages. Such hæmorrhages may occur at successive periods as was so well marked in the case reported by Whitehouse. The sclerocystic ovary, which is regarded as a product of ovarian infection, is contrasted with the cystic ovary which is regarded as a normal condition. The ovary is believed to be the organ of the body most frequently the seat of hæmorrhage.

The follicular form of ovarian hæmorrhage is by far the most common. The atretic follicle is probably the variety most easily affected with hæmorrhage, but the gravity of this condition is not to be compared with that in the mature follicle or in the corpus luteum as the latter are less apt to limit the blood loss into the peritoneal cavity and give rise to symptoms strikingly similar to those of ruptured tubal pregnancy and fully as grave.

The diagnosis of ovarian hæmorrhage seems to be very difficult because its symptoms are so much like those of ectopic pregnancy, acute appendicitis, perforated ulcers of the small intestines and the effect of various toxic agents. Of these conditions, ruptured ectopic pregnancy most closely resembles ovarian hæmorrhage in symptoms produced. Greater care in the study of cases and the consideration of ovarian hæmorrhage as a possibility will probably lead to a proper diagnosis before operation or autopsy. Reference is made to 19 cases in which provisional post-operative diagnoses of ectopic pregnancy were made. Fifteen of them were tubal and but two of this class passed a microscopic test. The four cases of ovarian hæmorrhage were also found microscopically negative as to pregnancy.

#### EXTERNAL GENITALIA

**Legueu, F.:** The Transperitoneovesicle Route in the Treatment of Certain Vesicovaginal Fistulæ (De la voie transpéritoneo-vésicale pour la cure de certaines fistules vésico-vaginales). *Bull. et mém. Soc. de chir. de Par.*, 1915, xlv, 170.

In 1914 Legueu introduced his intraperitoneal vesical section in the treatment of vesicovaginal fistula but had only one case to report. Since then



he has had a number of cases and has been able to systematize and develop the technique.

Intraperitoneal section is the only method which always permits primary union, entirely overcomes the fistulæ, obviates the necessity for a retention catheter, and leaves the patient in as favorable a condition as after an ordinary laparotomy. The object desired is to obtain a large field for the exploration of both the bladder and the vagina, and to be able to suture each organ independently and interpose peritoneum if necessary.

Legueu distinguishes operative and nonoperative fistulæ. In the treatment of the former, which are seen after total hysterectomy, the first step after the laparotomy consists in making a longitudinal median incision in the posterior wall of the bladder, extending down to, and including, the vagina. Generally after retraction of the edges of the incision the fistula is easily discovered.

In the second stage the connection between the bladder and vagina is closed, the vagina being sutured with silk and the bladder-wall sutured in three layers with catgut and silk.

The next stage is to cover the posterior face of the bladder and the superior pole of the vagina as completely as possible with peritoneum, the suturing being done with fine silk.

The use of this method is rarely indicated in obstetrical fistulæ and only when they are situated very high. Legueu has had one such case. The fistula is not necessarily on the median line but more usually to the right or left of it. In the literature he has found only one or two reports of transperitoneal operation for vesicovaginal fistulæ.

One of the advantages of the technique is that it affords a very great amount of light for access to the fistulæ and the search for, and closure of, the orifices. In general, the advantage of the transperitoneal incision is that it allows easy approximation of the bladder. The writer has never seen a fistula after operation. The peritoneum becomes

so perfectly adapted that the failures which occur in extraperitoneal sections are never observed.

Peritoneal infection is, of course, always possible, but precautions in the operative field protect against it.

Legueu has operated upon 12 vesicovaginal fistulæ in this way. Eleven were operative fistulæ following abdominal hysterectomy. There was one death from uræmia, which was not due to the method of operation. All the other patients recovered without any incident and the fistulæ were cured after the first attempt, no subsequent complementary operation being necessary in any case.

During the same period the author operated upon a number of obstetrical vesicovaginal fistulæ by other methods but has been far from obtaining the same percentage of immediate recoveries.

Legueu considers his method applicable more particularly to cases of operative fistulæ consecutive to total abdominal hysterectomy in which the fistula is high. For obstetrical fistulæ which are low the method is not suitable as they cannot well be reached through the abdomen. W. A. BRENNAN.

#### MISCELLANEOUS

**Da Costa, C. C.: Metameric Dysthenia** (Dystenia metamerica). *Arch. brasil. de med.*, 1919, ix, 10.

The internal genitalia are supplied with two types of sympathetic nerve fibers; the first, sympathetic, properly so called, being motor and secretory, and proceeding from the lumbar medulla; the other, autonomous and inhibitory and proceeding from the second and third sacral segments. The vagina or internal organs may be acted upon by these different elements, a fact which explains many of the phenomena observed in the genital region. The author discusses also various types of disturbances which may result in such metameric disorders.

W. A. BRENNAN.

## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Davis, E. P.: The Springs of a Nation's Life.** *Am. J. Obst.*, N. Y., 1919, lxxix, 177.

To secure a healthy infant population, it is absolutely essential that the conditions of life be such that early marriage may be encouraged. A living wage, sanitary and comfortable dwellings, civic sanitation, including a pure and reasonable food supply, and all agencies which make for physical, mental, and moral hygiene are of the utmost importance.

No greater curse upon the nation in the care of its infant population could be advised than the presence of a large standing army.

The crying need in the prevention of infant mortality is better obstetrics. It is true that in order to make improvement in obstetrics possible, the economic and other factors to which reference has been made are necessary, but it is also true that without better obstetrics these factors will be of little value.

The encouragement of the early marriage of healthy persons is a step of primary importance. Marriage among those physically unfit is to be discouraged or forbidden. It may not yet be possible to require a physical examination of men and women before marriage, but certainly the need for it is evident.

Education of the laity, nurses, and doctors in matters concerning the increase and care of the population is of paramount importance.

The suggestion is made that a brief, clear statement of the symptoms of dangerous conditions arising in pregnant women be posted in rooms used only by women throughout the country. Also that the attention of expectant mothers be called to the dangers of miscarriage and convulsions and the hæmorrhages occurring during pregnancy.

Among the most recent measures of interest in the prevention of infant mortality are those due to the recognition of the value of prenatal care among parturient women. Second in importance is the campaign instituted by the Army and Navy against venereal disease, and third, the fight against tuberculosis. Also important is the movement to abolish the use of alcohol. The author states that if all of the measures proposed could be efficiently carried out, the result upon the infant population would be amazingly good.

EDWARD L. CORNELL.

**Meyer, A. W.: The Occurrence of Superfoetation.** *J. Am. M. Ass.*, 1919, lxxii, 769.

Under certain conditions in cases of twin pregnancy there are gross differences which are largely

responsible for the quite general belief in superfoetation. The usual menstrual period in women being twenty-eight days, it would seem that the foetus of one conception would rather effectively occlude the uterine cavity and alone make difficult fertilization of any ovum liberated at a subsequent ovulation. Besides this, there is the possible effect of the cervical mucus plug to which reference is made so frequently. Another obstacle to implantation might be the condition of the decidua, even if later ovulation occurred.

Loeb found that in the pregnant guinea-pig the endometrium cannot be stimulated to form a new decidua. Therefore it is evident that if similar conditions obtain in women, the fertilized ovum might encounter great difficulties. While a few investigators have reported cases of ovulation during pregnancy, exact knowledge is so slight that the entire matter remains undecided. It is interesting to note that in the past papyraceous foeti have been regarded as examples of superfoetation.

I. W. BACH.

**Cornell, E. L., and Stillians, A. W.: The Value of the Wassermann Reaction in Pregnancy.** *J. Am. M. Ass.*, 1919, lxxii, 551.

The authors question the results obtained by Falls and Moore relative to the positive Wassermann test in pregnancy in private cases. Eleven and three tenths per cent positive reactions, if correct, would show that a large number of syphilitics in private practice were escaping detection. Cornell ran a series of Wassermann tests consecutively in his own private practice, finding 3.6 per cent positive reactions in 107 cases. Two of the four patients gave a history pointing to syphilis, while the histories of the other two were not at all suggestive. In Stillian's series of 101 charity patients who entered the Chicago Lying-In Hospital, the Wassermann reaction was positive in a little less than 10 per cent, a figure practically agreeing with that of Falls and Moore. Two of these patients had active skin lesions and two gave a history pointing to syphilis. The history of the others was little suggestive of syphilitic infection.

In Cornell's cases, the attention is attracted by the number in which there was a history of abortion or stillbirth. In all probability these patients were not syphilitic. Twenty and three tenths per cent of the patients gave such a history but in the authors' opinion it does not seem reasonable to ascribe any large proportion of these occurrences to syphilis which has since become extinct or beyond reach by clinical or serological recognition. Cornell has tried to ascribe many of these stillbirths to focal infection.



The authors summarize as follows:

1. Our first series of private cases of pregnancy gave only 3.6 per cent of positive Wassermann reactions.
2. Our second series of charity cases gave nearly 10 per cent of positive reactions.
3. More than one third of these positive cases were detectable only by the serum examination.
4. Routine Wassermann reactions in pregnancy are amply justified by these findings.
5. A surprisingly large number of apparently nonsyphilitic women give a history of frequent abortions.
6. The Wassermann reaction should be checked by searching for the spirochete and by postmortem examinations when possible.

**Hansen, T.: Ileus Complicating Pregnancy** (Ileus under Svangerskab). *Ugesk. f. Læger*, 1919, lxxxi, 356.

Up to 1916 there were reports in the literature of 102 cases of ileus complicating pregnancy, 57 of which proved fatal. In 64 cases in which operation was performed the mortality was 45 per cent, while in the 38 cases not treated surgically the mortality was 71 per cent.

The condition is generally due to complications arising from the formation of adhesions in the abdomen following some previous operation, pressure of the pregnant uterus on the bowel being the cause in only a few cases.

The question of the desirability of emptying the pregnant uterus in an operation for ileus is undecided. Essen-Möller recommends such emptying by a vaginal cesarean section as in 24 of 33 cases studied by him the abdominal operation was followed by abortion.

The author reports 2 of his own cases. The first was that of a 34-year aged 37 years whose last labor occurred thirteen years before. Since then she had been operated upon for extra-uterine pregnancy. A few months after her last menstruation she was seized with violent abdominal pains. Because of these and subsequent symptoms of intestinal occlusion she came to the hospital. At operation a thick fibrous band was found strangulating the small intestine and was excised. The patient was discharged a month later and delivered normally at term.

The second case was that of a woman aged 25 years who had been operated upon five years previously for appendicitis. In the sixth month of her last pregnancy she came to the hospital with symptoms of intestinal occlusion. A fibrous band was found passing from the small intestine near the ileo-cæcal valve to the transverse colon, the small intestine being kinked over it. The band was ligated and removed. The woman made an uneventful recovery and, like the first patient, was delivered normally at term.

The uterus was not disturbed in either case.

W. A. BRENNAN.

**Hirst, J. C.: The Control of the Nausea and Vomiting of Pregnancy by Intramuscular Injections of Corpus Luteum Extract.** *Am. J. Obst.*, 1919, lxxix, 327.

Two preliminary reports on this subject have already appeared. The present paper covers a series of 111 cases, including those already published.

Every woman during the period of sexual activity is constantly absorbing corpus luteum. No sooner is the corpus luteum of one menstruation disposed of, than another appears to take its place. With the onset of pregnancy, this absorption ceases. The corpus luteum of pregnancy increases in size until about the third month. From that time on, it is gradually absorbed. Is it not reasonable to assume that this is not coincidence, but cause and effect, and that the corpus luteum plays an important part in relation to the nausea?

In the average case, in which the nausea amounts only to discomfort and the vomiting is limited to one or two morning attacks, the patient will usually respond to a dose of 1 mil every other day for five or six doses. Particularly is this true in cases in which the nausea has begun to decline. In these cases the effect is almost immediate. In more severe cases, when nausea is constant and the patients are subject to frequent paroxysms of vomiting at any time during the day, the dose should be 1 mil daily for from twelve to fifteen doses. During the period of treatment, the patient's activity should be curtailed and she should take as much rest as possible.

In pernicious cases, the author has given 1 mil twice daily, and states that he would not hesitate to give more than this.

The material used is put up in ampules containing  $\frac{1}{3}$  gr. of soluble corpus luteum powder in 16 min. of physiologic salt solution saturated with chlorbutanol for its local anæsthetic effect. The smallest number of doses in any successful case was four, and the largest, forty-four. The average number required in successful cases was eleven.

The extract was administered, under the author's own supervision, to 111 patients. The nausea varied from a very mild type to the most excessive type, several being actually pernicious. Of these 111 patients, 65 were entirely relieved and 34 were so improved that what nausea remained after the usual twelve doses of extract had been given was so slight that they declined further treatment as unnecessary to their comfort. Thus, 99 of the 111 patients were entirely relieved or made comfortable. In 8 cases the extract had no beneficial effect whatever and was therefore discontinued after the twelfth dose. In 4 cases the nausea was considerably increased and in 2 of these it was alarmingly increased. All 4 of these patients had a marked goiter, and therefore the author has discontinued the use of the extract in cases with this complication.

In only 2 of the cases was there any anaphylactic reaction and in both the result was failure. One patient had urticaria and one severe headache without prostration.



The risk of abortion is certainly not increased by the administration of the extract. Of the 111 patients, only 4 had abortions, a percentage decidedly lower than the average.

Brief case reports of 12 unsuccessfully treated cases are given.

EDWARD L. CORNELL.

**Mosher, G. C.: Forty-Four Cases of Pregnancy Toxæmia Since May, 1917. Results of Standardized Treatment.** *J. Missouri M. Ass.*, 1919, xvi, 69.

During the past winter, the writer had under observation among his own patients and those referred or seen in consultation, 22 cases of pre-eclamptic toxæmia or eclampsia. Since May, 1917, 39 patients have been under treatment. Within the last twelve months 5 cases of pernicious vomiting, another type of toxæmia of pregnancy, have been observed.

The reason why, in the six weeks from Jan. 1 to Feb. 15, 1918, there were as many such cases as are ordinarily met with in a year, is a mystery. The writer is at a loss to account for this fact except by charging it to either the extreme changes in temperature from bitter cold to mild weather and back again (just as epidemic jaundice and herpes zoster have in some seasons been ascribed to climatic conditions) or else to the nervous unrest and tension from which every sensitive woman suffered on account of the entrance of the United States into the war.

Knowing that next to sepsis, eclampsia is the most deadly of all obstetric complications, every woman has been examined, on coming under observation, with the realization that her symptoms may at any time suggest that she is a pre-eclamptic. As soon as pregnancy is recognized the blood pressure is taken, the eye symptoms are noted and the urine is examined as a routine procedure, and the teeth and tonsils are inspected for foci of possible infection.

The causes of eclampsia are formulated according to their relative values as follows:

1. Failure of elimination of toxins. In the early months these toxins are doubtless due to the placenta, and in the second half of pregnancy to the excretions of the fœtus.

2. Infections of various types which throw a burden on the pregnant woman.

3. Asphyxia of greater or less degree resulting from pressure and from stasis and a decrease in the normal maternal oxygenation due to interference with lung expansion and the action of the heart.

In every case of eclampsia some focus of infection will be found before the eclampsia develops.

The author has attempted to standardize the plan of prophylaxis and treatment as follows:

1. A diet of non-irritating food.
2. Stimulation of elimination by kidney, bowels, and skin. The intake and output of fluids are most important and must be shown in a daily report.
3. Eradication of all foci of infection in the tonsils, teeth, kidneys, and bowels.

4. Encouragement of deep breathing by fresh air and stimulation of the general circulation to prevent asphyxia.

5. Free ingestion of alkaline salts and food to prevent acidosis.

6. Administration of veratrum viride to lower the blood pressure, to reduce the pulse, and to aid diaphoresis.

7. The emptying of the uterus as a therapeutic measure. This should be done in the way least conducive to shock and is indicated as soon as prophylactic measures fail. Every one at all familiar with the toxæmia of pregnancy recognizes the marked improvement of the patient's condition following the removal of the products of conception.

The uterus is emptied under ether anæsthesia, ether being the only safe inhalation anæsthetic in these cases.

The technique involving the least shock is as follows: (1) Preliminary gradual dilation by Hegar's dilators up to No. 20, and (2) Voorhees bag No. 4, if at term. After the uterus is emptied gavage of soda bicarbonate, 2 per cent, should be given. Cases of the fulminating type, with a long, hard cervix (in which no vaginal examination has been done) are best treated by classical cæsarean section.

When after contamination by frequent digital examination infection is to be expected, a Porro or other hysterectomy should be done in the interest of the mother.

The results in this series of cases show 95 per cent recoveries of mothers, and 85 per cent of children at term.

Twenty case reports are given in detail.

EDWARD L. CORNELL.

**Briggs, H.: Placenta Prævia.** *Brit. M. J.*, 1919, i, 179.

The chilling aspect of an avoidable stillbirth in placenta prævia leads the author to make some pointed observations on the management of this obstetric complication. He cites cases of its proper successful management and by contrast reviews instances of failure.

This clinical situation appeals for improvement which must be reached by earlier concentration and co-operation in regard to three important particulars: (1) the ante-partum hæmorrhage; (2) the viability of the fœtus; and (3) the bulk and area of the placenta within the zone of obstruction. The distressing antepartum hæmorrhage has received maximum attention by the liberal sacrifice of the fœtus as a plug. A live fœtus situated mostly above a thickened and damaged placenta has faint prospects of survival. In the graver degrees of placenta prævia only a speedy and safe birth-route can meet all of the requirements of labor.

Eight case reports are as follows:

Case 1. Cæsarian section for central placenta prævia. The patient, 40 years of age, vi-para, had had two smart hæmorrhages lasting respectively two days and one day and occurring one week apart in the thirty-fifth and thirty-sixth weeks of



gestation. Eight days after the second hæmorrhage the bleeding returned in increasing volume. Cæsarian section was done five hours after the onset of this attack, with delivery of a live child weighing 6 pounds, 3 ounces. The placenta, which was attached four-fifths on the left and one-fifth on the right of the cervix on the anterior uterine wall, weighed 12½ ounces. A normal convalescence followed for both mother and child.

The diagnosis here concerned the detection of the hæmorrhages, the location of the placenta around the cervix in the lower zone of the uterus, and the viability of the child.

Case 2. Cæsarian section for low lateral placenta prævia: The patient, who was a primipara, 39 years old and in labor, had one severe hæmorrhage when a diagnosis was made of low lateral placenta prævia. Immediate cæsarian section saved both mother and child.

The author presents also some cheerless contrasts as object lessons.

Case 3. Central placenta prævia at term. In 1914 a woman at full term died of hæmorrhage in the ambulance on the way to the Liverpool Maternity Hospital. Postmortem examination revealed an undilated cervix, a fully developed male child of large size, a central placenta prævia, and an inappreciable separation of the placenta. In this case it was not proved that the antepartum hæmorrhage was observed, or that the presence of a low implantation of the placenta was determined in the presence of an undilated cervix.

Case 4. Central placenta prævia at term. This patient had one sharp warning hæmorrhage in the night, followed by another a week later with the onset of labor. Collapse increased during the delay of twelve and a half hours in getting the doctor and removing the patient to the hospital. She was admitted to the hospital at 2:30 a. m. in profound collapse, a condition which was treated by intravenous saline and pituitrin. A podalic version was then done, after which the bleeding stopped, but the shock ended fatally three hours later. In this case delay seems to have been responsible for the double loss.

Case 5. Central placenta prævia at the thirty-fifth week. In this case the occurrence of two sharp hæmorrhages one month apart is reported. At the time of the second, which occurred twenty-four hours prior to admission to the hospital, packing was resorted to. As the blood re-appeared at the vulva, a vaginal examination was made. This showed two fingers dilatation, a vertex presentation, and a complete placenta prævia. The treatment consisted in digital perforation of the prævial placenta and version. Two hours later the still-born child came through the placenta. The loss of blood had not been severe, and the patient made a normal recovery. The foetal sacrifice in this effective method of providing for maternal safety cannot be avoided by using the Champetier de Ribes bag, for cervical dilatation does not abolish the placental obstruction

and placental damage which are potent causes of still-birth.

Case 6. Low lateral and over-lapping placenta prævia. The patient, who was 29 years of age and had had four children, was admitted to the maternity hospital at 10:30 a. m. with slight but gradually increasing hæmorrhage. On insertion of the Champetier de Ribes bag at 4:30 p. m. the separated lower third of the placenta was found thickened and indurated and hanging over the promontory, thus diminishing the conjugate. The head remained loose above the brim of the pelvis. In three quarters of an hour, with dilatation completed, the bag was removed and a version performed. The foetal heart rate was one hundred and thirty. The placental mass was 1 to 1¼ inches in thickness. In three hours a still-born foetus was expelled. The mother recovered. Placental obstruction to labor is incontestable. Variations in the bulk and area of the placenta prævia and in the extent of the damage to it are compatible with variations in their effects on the destruction or preservation of foetal life during labor.

Case 7. Placenta prævia with prolapse of the placenta. In this case the larger part of the placenta was found early in the vagina, the smaller portion still attached anteriorly in the uterus. Bleeding and labor began twenty-four hours prior to admission to the hospital. Loss of blood was then free and there was a shoulder presentation. Internal podalic version was soon followed by expulsion of the placenta which preceded the assisted delivery of a foetus weighing 6 pounds, 6 ounces. The patient, who was 30 years of age, had had five children and one abortion.

Case 8. The patient, viii-para, was 32 years of age. Labor pains and bleeding began simultaneously. The membranes ruptured two hours later, and in two hours more the hæmorrhage had practically stopped. Six hours after the beginning of labor there was full dilatation and the placenta appeared at the vulva. Twenty minutes later the foetus in the membranes was expelled. There was no excessive blood loss at any time.

The conclusions drawn are as follows:

1. The initial hæmorrhage is a warning to be taken seriously. Equipment is required; also prompt transference of the patient to a hospital or a nursing home.

2. The viability of the foetus at or after the thirty-sixth week of gestation is acceptable; induction of premature labor has practically proved this; cæsarean section is unlikely to disprove it.

3. The bulk and area of the placenta prævia in the zone of obstruction can be approximately estimated by examination. This obstruction may be an important item in directing the management of the labor.

If early opportunities and complete equipments are obtainable, the three particulars mentioned are more consistent with maternal and foetal safety by cæsarean section than by any other method of



treatment of placenta prævia. Debatable matters have developed amid the large number of cæsarean sections already published. The defects and hazards of the earlier operations have been recognized. Opposition will wane with better selection.

The present attitude of obstetricians lacks neither prejudice nor proof. Caution is cherished due to lapses in opportunities and the gaps in equipments yet to be banished by an ever-increasing co-operation.

C. D. HOLMES.

**Canales, M.: A Case of Total Premature Detachment of the Placenta** (Un caso de desprendimiento total precoz de la placenta). *Repert. de med. y cirug.*, 1919, x, 172.

Canales' case was that of a woman aged 42 years who was at term in her fifteenth pregnancy. When examined some days before, the head was found presenting and there were no abnormal signs. At the onset of labor the pains and contractions were normal. Suddenly a sharp pain was felt and the patient soon showed all the symptoms of syncope and severe internal hæmorrhage, with a flow of blood from the vagina. Examination led to the diagnosis of premature detachment of the normally inserted placenta.

Serum was administered, the cervix dilated, and the labor terminated. The extracted foetus was dead. With some difficulty the placenta, which was found in the vagina, was expressed with an enormous number of clots. The puerperium was normal.

The author excludes all causes for the accident except multiparity in which condition the placenta is not likely to be firmly attached and may easily yield on strong uterine contractions.

W. A. BRENNAN.

**Vogt, W. H.: Ablatio Placentæ, with Report of a Case Treated by Cæsarean Section.** *J. Missouri M. Ass.*, 1919, xvi, 47.

The frequency of this condition has no doubt been greatly underestimated. The writer has seen 8 cases in consultation, none of which had been diagnosed by the attending physician. Attention is called to the case reports of Williams, in which he mentions the pathologic changes in two uteri which had been removed by cæsarean section. Hæmorrhagic infarctions of the myometrium, extensive thrombosis, and peculiar arterial changes were found. Williams concluded from these examinations that arterial changes are probably very common, toxic in origin, and due to the action of some substance which, circulating in the blood, possibly produces changes in the smallest arterioles and thus permits the blood to escape into the tissue. This condition has been designated by Couvelaire as uteroplacental apoplexy.

Mention is also made of the experiments of Morse, in which the pregnant uteri of dogs were over distended with sterile salt solution to the point of bursting. After forty-eight hours the abdomen was opened. An abortion was found to have taken place, but no extravasation of blood into the myometrium.

From this it was concluded that an extreme over-dilatation will not cause hæmorrhage into the myometrium. Morse later tied off various groups of veins in the uterus of the pregnant rabbit to determine the effect of venous blocking. He found no perceptible changes, for always there was sufficient collateral circulation. Not until he tied off all three groups of veins, the ovarian, the mesometric and the uterovaginal, was the result obtained. After two hours the uterus was opened and its cavity found to be filled with blood. The placenta was partially or completely separated. Minute hæmorrhages were visible in the myometrium. In other words, the experiment produced a premature detachment of the placenta and the same conditions that are found in ablatio placentæ of the accidental type. The cause of this blocking of the veins in the pregnant woman is not fully explained, but it is thought that the great mobility of the uterus which is permitted by the often greatly relaxed abdominal walls in the multiparous woman, might be mentioned as a contributory cause. It is therefore suggested that more attention be paid to the proper support of the pregnant uterus to prevent such free mobility and great torsion.

The symptoms depend on whether the hæmorrhage is that of the concealed or the revealed type. In the early stages ablatio placentæ consists in the development of a decidual hæmatoma which causes compression and places a portion of the placenta out of function. These cases are perhaps quite frequent. As a rule they show no clinical symptoms and are recognized only after the examination of the freshly delivered placenta when a smaller or larger blood clot is found on its maternal surface. In the severe forms of concealed, as well as revealed, hæmorrhage, the uterus becomes extremely hard and has a very tense feeling which as a rule makes it impossible to map out the foetal parts. The foetal heart tones are naturally absent and there is always intense shock.

The diagnosis of ablatio placentæ should be a simple matter. Practically all antepartum hæmorrhages are due to a separation of the placenta from the uterine wall, and it behooves us to differentiate between a placenta prævia and ablatio placentæ.

If placental tissue can be felt either covering the internal os or lying to one side or the other, the diagnosis of placenta prævia becomes a simple affair. If, on the other hand, no placental tissue can be felt, we are justified in making a diagnosis of ablatio placentæ. The essential points in diagnosis are bleeding, evidences of shock and anæmia, a hard and firm uterus which suddenly increases in size, the inability to palpate the foetal parts, and the absence of the foetal heart tones, or evidences of internal hæmorrhage. The amount of external bleeding is no guide to the amount of blood lost.

In the treatment it must be borne in mind that bleeding due to detachment of the placenta will continue until the uterus has been emptied of its contents. Therefore it is most important, first, to empty



the uterus, and second, to control or stop the bleeding and relieve the anæmia and shock.

When there is complete dilatation of the cervix, version or the application of forceps is indicated. If such dilatation is not present, however, it is the writer's belief that abdominal cæsarean section should be the method of choice since it offers the best chance for the mother and gives the only possible chance of a living child. It likewise affords the surgeon the opportunity of dealing with postpartum hæmorrhage in the surest way, i. e., by supravaginal amputation of the uterus. Vaginal packing and the use of the various rubber bags do not seem advisable for the reason that they are too slow in their action.

Va inal cæsarean section may be done if one is skilled in operating, but cannot compete with abdominal cæsarean section.

The following case is reported:

A woman, 38 years old, who had three living children, and whose previous labors had been normal, was sent to the hospital in a state of shock. The time of her last menstrual period could not be definitely ascertained, but from the patient's statement and the findings it was estimated that she had been pregnant about seven months. There were no uterine pains except extreme sensitiveness to touch. The fundus of the uterus reached to the xiphoid process. The fetal parts could not be felt or the fetal heart tones heard. There was no vaginal bleeding and no history of the rupture of the bag of waters. The extremities showed marked œdema. In the urine was a large quantity of albumin and granular and hyaline casts. The diagnosis was internal hæmorrhage due to separation of the placenta. Owing to the seriousness of the case, immediate delivery was decided upon. The use of a general anæsthetic being prevented by the patient's precarious condition, novocain was used for local anæsthesia. A cæsarean section with the high incision was made without difficulty and a dead seven months fetus promptly extracted. The placenta lay practically loose in the uterus which was filled with dark blood clots. Pituitrin, 1 cc., given before the operation was begun, controlled the bleeding from the incision in the uterus very satisfactorily. The uterus and abdomen were closed in the usual manner, after which stimulation was given. Several hours later, however, the patient was seized with an attack of eclampsia from which she died in about half an hour. No postmortem was obtained.

The conclusions drawn were as follows:

1. Ablatio placentæ is not so rare as is generally believed.
2. With care and observation, all cases of ablation placentæ, of the severe type particularly, should be recognized.
3. When concealed hæmorrhage with shock and anæmia are present in the absence of cervical dilatation, the abdominal cæsarean section should be the operation of choice; when there is no contraction of the uterus, a supravaginal amputation should be performed.

4. Most important is the proper diagnosis and prompt and rapid interference by some method which causes the least injury to the mother.

**Bandler, S. W.:** *The Technique of Cæsarean Section.* *Internat. J. Surg.*, 1919, xxxii, 65.

Bandler gives morphin and atropin one hour before operation; also a vaginal douche of iodine solution. The anæsthetic used is gas-oxygen with a minimum of ether, if any. The skin incision is vertical and above the umbilicus. Pituitrin is given before the peritoneum is reached. The uterine closure is done in layers. Catharsis is begun twenty-four hours after the operation and small repeated doses of ergot are prescribed for a week.

W. F. HEWITT.

**Niemack, J.:** *Cæsarean Section and Other Obstetrical Problems.* *Interstate M. J.*, 1919, xxvi, 118.

The application of modern eugenic ideas to problems of obstetrical and surgical technique is the keynote of the article. It is the author's conviction that in obstetrics every problem must be individualized and humane principles rather than stereotyped rules accepted.

Eight cæsarean sections and two hysterectomies of the pregnant uterus with 100 per cent good results are reported. In no case was there an absolute indication; four were for placenta prævia, two for narrow pelvis, one for eclampsia and one for vagina duplex. When there is a predisposition to epilepsy, cæsarean section is advocated for an overlarge child so as to avoid additional birth trauma.

With the exception of one woman who had a small hernia, all of the mothers in the cases reported made a normal recovery and have strong abdominal walls. The author advises the imbrication of the upper part of the abdominal incision if time permits as at the end of pregnancy the walls about the umbilicus are very thin.

In performing a cæsarean section the author uses the transverse incision of the uterus. Attention is called to the great unevenness in the thickness of the walls of the fundus of the uterus. It was always possible to pack the great omentum in between the incision in the uterus and bowels and thus with certainty prevent dangerous adhesions. As there is need for broad coaptation of the uterine walls, he sees no reason why the first row of stitches should not be allowed to penetrate the endometrium. During manual removal of the afterbirth, the hand is never in contact with the uterus, but remains always in the amniotic sac. "Boldness and absolute confidence in his ability to control hæmorrhage after extraction \* \* \* and strict avoidance of uncalled-for examinations by the obstetrician are needed for successful operation." The author calls attention especially to the fact that in placenta prævia manual examination is never necessary unless a decision has been made to proceed with version and extraction.



The two cases of hysterectomy reported the author considers are open to discussion but believes that the humane and eugenic principles were paramount. The first case was that of an imbecile, highly sexual girl, a county charge, who was hysterectomized in the fifth month. There were twins. The second case was that of a 15-year-old girl with gonorrhœa of the cervix and early pregnancy. In commenting on this case the author says: "Local applications to the cervix would bring on abortion sooner or later. \* \* Would there not be salpingitis after that? If the cervical affection be left alone and the full term awaited, what then about salpingitis? In either case sterility would ensue." In the meantime, the girl would have been the source of many infections. To quote again: "We did hysterectomy and then speedily cured the gonorrhœa. The possible (but possibly blind) baby was sacrificed and the girl permanently sterilized, but was it unchristian, unprofessional, unsurgical? Did we not help in saving more out of this wreck than could possibly have been saved in any other way? Let every one answer for himself."

In conclusion the author states that there are very real problems before the doctor of today the open discussion of which, without hysteria or hypocrisy, should be encouraged.

**Beck, A. C.: Observations on a Series of Cæsarean Sections Done at the Long Island College Hospital During the Past Six Years.** *Am. J. Obst.*, N. Y., 1919, lxxix, 197.

In this paper the author presents a detailed report of 37 personal cases, a morbidity study of 107 consecutive sections and an improved technique for this operation.

Much has been written concerning the too frequent use of cæsarean section as a means of overcoming obstetrical difficulties. Its dangers are being constantly brought out while very little is said of the dangers of the cruder measures which serve as the only alternative in difficult cases. Craniotomy and decapitation in neglected cases are associated with a high maternal mortality. The same may be said of version and extraction when performed late in labor, long after the membranes have ruptured and the presence of Bandl's ring warns of an impending rupture of the uterus. Forceps on the unengaged head likewise cannot be regarded as an absolutely safe operation. Nothing is said of these sequelæ when we are reminded of the possibility of the rupture of a cæsarean scar.

In the author's 37 cases of cæsarian section only one woman died and in all probability the operation had little to do with this fatality as the patient was an eclamptic. Three infants died soon after birth; all were premature. In 2 cases, the operation was the best procedure to employ in the interest of the mother. In the third, a case of placenta prævia, the outcome was unsatisfactory as this means of delivery was chosen largely in the interest of the child.

The cases are classified according to the indications. Pelvic dystocia was the principal indication in 16 cases. Of these, 9 showed marked contraction while 7 were of the border-line variety. All mothers and infants in this group survived. Fœtal dystocia was present in 3 cases. Convalescence in each of these was uneventful. All of the infants lived. There were 3 cases of cervical dystocia with no deaths. Postoperative dystocia was encountered once. Large fibroid tumors in the pelvis were the cause of marked dystocia in 2 cases. In 5 cases an abnormal presentation combined with other complications was the indication. Placenta prævia and eclampsia accounted for 2 cases. The eclamptic patient died.

The records of all of the cæsarian sections performed during the past six years, numbering 107, have been reviewed from the standpoint of morbidity and mortality. During this period, 2 mothers died of eclampsia shortly after operation. Deducting these 2 cases, 105 remain. Four of these 105 patients died, a gross mortality of 3.8 per cent. Of the 19 cases handled on the outside, 3 were lost, a mortality of slightly under 16 per cent. Only one patient died of the 86 treated wholly in the hospital, a mortality of a trifle over 1 per cent. Most of the cæsarian sections which have been followed by peritonitis showed the first signs of peritoneal involvement from five to seven days after operation. Of the operations the purpose of which is to give better peritoneal protection, the Krönig procedure has been the most satisfactory. Occasionally, however, this technique has not given a good result.

EDWARD L. CORNELL.

**Carlini, P.: A Vaginal Cæsarean Operation** (A propos d'une opération césarienne vaginale). *Rev. mens. de gynéc., d'obst. et de pédiat.*, 1919, xl, 49.

Carlini discusses a recent report by Delmas who performed a vaginal cæsarean section on a woman with a flat rachitic pelvis after he had failed to induce delivery at the beginning of the eighth month by the use of Krause sounds.

Consideration is given also to the question as to the feasibility of vaginal cæsarean section performed by the average obstetrician in the patient's home. While most surgeons believe that the procedure does not lie within the scope of the average practitioner, they do not offer any suggestion as to what should be done when it is impossible to induce labor.

Attention is called to the great value of the mechanical cervical dilator of Bossi, the use of which is simple and within the ability of every physician. By means of this dilator pregnancy can be terminated without accident in from three to five minutes. The method, which is thirty years old, has received favor both in Italy where it originated and elsewhere. Twelve of the author's own cases in which delivery was affected in this way are reported. The method is unquestionably preferable to the vaginal and abdominal cæsarean operations, and by means of it labor may be induced at whatever time it is considered best.

W. A. BRENNAN.



**Hartman H. and Bergeret A.: Remarks Upon 186 Consecutive Cases of Extra-Uterine Pregnancy Observed in the Early Months** (Quelques remarques à propos de 186 cas consécutifs de grossesse extra-utérine observées dans les premiers mois). *Ann. de gynéc. et d'obst.* 1919, xlii, 321.

The authors have treated surgically 186 cases of extra-uterine pregnancy.

The ages of the patients varied from 18 to 45 years, the greater number being from 25 to 35 years old.

The time at which puberty was established did not seem to have any particular significance.

Forty-seven of these women were delivered at term in one prior pregnancy; 37 were not. All the others had had two or more normal pregnancies ending at term. Sixty-six had had no previous abortion, and 48 at least one.

In 69 of the cases there had been previous treatment for some utero-adnexal lesion. The authors draw attention to this high figure. Of these 69 women, 64 had ampullar pregnancies and 5 interstitial pregnancies.

Extra-uterine pregnancy occurred more frequently on the right side (90:70). Nearly all were tubal. Of 93 cases in which such findings are stated there were 74 cases of hæmatosalpingitis without a recognizable embryo, and 14 with a living embryo.

In only 3 cases were abdominal pregnancies observed in which the ovum was fixed and developed in the abdominal cavity. Of 153 cases of which details are given, 150 pregnancies were tubal. In 1 case the placenta was implanted in the infundibulum and connected with the intestine. In only 2 cases was the placental insertion on one of the pelvic parts of the large intestines (colon or rectum).

Of 119 ampullar pregnancies, 27 ruptured but only 4 were followed by peritoneal inundations. The others gave rise to limited hæmatocèles. In isthmic or interstitial pregnancies rupture with peritoneal flooding is usual. Thus, in 24 cases of isthmic pregnancy, flooding occurred in 23, and in 3 cases of interstitial pregnancy it occurred in 2. From the point of view of hæmorrhage, therefore, there is a distinct difference between ampullar, and isthmic and interstitial pregnancy.

Study of the cases shows further that usually there are pathologic lesions in the utero-adnexal appendages and that such lesions have an action in the development of extra-uterine pregnancy. Hence Lawson Tait's idea that a tubal pregnancy may follow ampullar salpingitis seems to the authors in many cases to be admissible.

The operation usually practiced was a unilateral salpingo-oophorectomy. This was done in 121 cases with cuneiform resection of the uterine cornu and in 3 with salpingoplasty of the opposite side. There were 115 recoveries. Of 6 deaths 4 were due to acute anæmia. Twenty-one subtotal abdominal hysterectomies gave 20 recoveries and 1 death. Nine total hysterectomies gave 8 recoveries and 1 death.

With regard to the interesting question of the genital future of women who have been subjected to unilateral salpingo-oophorectomy, 44 such patients were traced for more than five years. Five have had children; 4, abortions; and 5, recurrences of ectopic pregnancy. The figures show that the proportion of normal and abnormal pregnancies following the operation is the same. No doubt pregnancy is avoided.

The histories of 21 cases of particular interest are given in detail. W. A. BRENNAN.

## LABOR AND ITS COMPLICATIONS

**Goldsborough, F. C.: Induction of Labor in the Subnormal Pelvis.** *N. Y. St. J. Med.*, 1919, xix, 43.

In the management of labor in borderline pelvis, Goldsborough emphasizes the fact that unless we make a thorough study of the case—pelvis and child—we frequently encounter difficulties which end in disaster to the mother or the child, or both.

After reviewing all the data relative to a thorough understanding of the possibilities in this class of cases, he concludes as follows:

"I hope that I have indicated that by careful examination before term, and in certain cases inducing of labor just before term, we are enabled to safely accomplish delivery for both mother and child without subjecting either to any undue risk, whereas if these patients with sub-normal pelvis are allowed to continue in the pregnancy until spontaneous labor begins, we frequently encounter difficulties due to the undue size of the child and have to resort to more serious operative procedures to accomplish a delivery, often with unsatisfactory results to both mother and child." H. B. MATTHEWS.

**Coburn, R. C.: Nitrous Oxide Analgesia in Labor.** *N. Y. J. Med.*, 1919, xix, 37.

The author believes the day has arrived when women are going to demand relief from the pain of childbirth. And why not? "Twilight sleep," he continues, "has had its day" and has accomplished a great deal of good, "not because it was founded on a proper basis, but because it was so widely advertised and presented in such a spectacular manner."

It was the ardent endeavor to find a substitute for morphin-scopolamin anæsthesia that led to the extensive use in labor of nitrous oxid gas, which the author believes is an ideal obstetrical anæsthetic. It may be used as an analgesic or anæsthetic. It may be administered by the patient or by an attendant. All the effects of any other anæsthetic can be obtained from nitrous oxid, and its action is vastly more transient and has the least effect upon tissue change. It does not hinder the progress of labor, but actually accelerates it. It is safe for the child.

The author firmly believes that nitrous oxid-oxygen analgesia or anæsthesia is the preferred method in the production of painless childbirth.

H. B. MATTHEWS.



**Harper, P. T.: The Clinical Courses of Labor in Breech Presentations, with Special Reference to the Prevention of Complications.** N. Y. *St. J. Med.*, 1919, xix, 45.

Harper very exhaustively discusses the clinical course of labor in breech presentations and points out very graphically the ways and means for the prevention of complications.

He states that, as is well known, there is a mechanism of labor peculiar to breech presentations, and unless this mechanism is thoroughly understood by the accoucheur, complications will oftentimes arise.

The most common complications of delivery by the breech are: (1) Dry labor; (2) retraction, which the author uses synonymously with the term "impaction;" (3) extended arms; (4) intra-uterine asphyxia from delay in delivery of the after-coming head; and (4) laceration of the pelvic floor.

The management of the usual breech labor is given in detail.

In concluding, the author says: "Attention is directed to the clinical aspects of labor in breech presentations in order that none but suitable cases shall be given the test of labor and that consideration of the physiological mechanism of labor peculiar to the presentation shall be the basis of conduct of those cases in which expectancy has been decided upon."

H. B. MATTHEWS.

**Chamorro, T. A.: A Conservative Method of Treating Uterine Ruptures** (Contribución al estudio del método conservador en las rupturas uterinas). *Semana med.*, 1918, xxv, 755.

In the case reported the patient was 35 years of age and had had nine pregnancies. Six of the pregnancies and labors were normal; the seventh was terminated by forceps; and in the eighth the foetus was extracted dead. The uterine rupture occurred after the recent labor had lasted thirty-six hours. The foetus, which was extracted after a version, was dead. It weighed 3,000 gr.

In treating the uterine rupture the author applied the method first described by Boero in 1910 which consists in introducing the hand through the vagina, seizing the upper lip of the rupture by the fingers, and drawing it down until it laps over the lower lip. The upper lip is then strongly held by forceps. This procedure is repeated along the upper lip of the uterine wound until the whole upper part of the wound overlaps the lower part and the peritoneal face of the upper lip is opposed to the uterine face of the lower lip. The uterine cavity is then tightly packed with gauze to keep the parts in place. The patient is placed in the Fowler position with ice to the abdomen and permanent proctoclysis. The drawing down of the upper lip of the wound is much facilitated by externally pushing the uterus downward.

In Chamorro's case the forceps were released after seventy-nine hours. The temperature remained normal till the fifth day when there was a rise which fell after the administration of a laxative.

The loss of blood was not great, about 300 gm., and the recovery was easy.

An examination several months later showed that the overlapping tissue could be felt as a linear scar about 1 cm. wide. There has been no further disturbance.

W. A. BRENNAN.

## PUERPERIUM AND ITS COMPLICATIONS

**Hicks, C. F.: Puerperal Gangrene of Both Legs Extending to the Knees; Double Amputation; Recovery.** *W. Virginia M. J.*, 1919, xiii, 337.

The patient, aged 20, was delivered normally on January 14, 1916. She had always enjoyed good health, had borne two children previously, and the puerperal period following this delivery was normal. Four weeks after confinement she complained of pain in the feet and ankles. The ankles were swollen, somewhat tender to the touch, and exhibited a few vesicles. In a few days the condition was worse, pain and a tingling sensation being felt in the feet and legs. In two weeks the toes were swollen and cold and were taking on a dark purple color. Complaint was made of much pain in the ankles which radiated up the legs. The gangrene which had started in the toes, began first in the left foot and extended to the ankles and up the legs gradually. Repeated examinations of the urine were always negative.

When admitted to the Welch Hospital on March 3, the temperature was 101 F. and pulse 110, soft and regular. The patient's past history was negative as to infectious diseases. The pelvic examination was negative and the uterus in normal position. There was no lochia.

The feet and legs were markedly swollen, extremely tender to the touch, cold, and in some places showed vesicles. The discoloration was very black, but near the knees shaded off to a dark purple. Near the tubercle of the tibia was a faint line of demarcation. The patient complained of pain in the knees and calves of the legs.

On March 4, the temperature was 101 and the pulse 120. The left leg was amputated above the knee. The operation was well borne and on March 6, the other leg was amputated above the knee. Following this, the temperature came down to normal immediately while the pulse dropped to normal gradually.

A good recovery was made. The wounds healed without infection, the stitches were removed on the tenth day, and the patient was discharged from the hospital on the fourteenth day.

EDWARD L. CORNELL.



# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Willems and Goormaghtigh: Traumatic and Tuberculous Lesions of the Suprarenal Capsules** (Lésions traumatiques et tuberculeuses des capsules surrénales). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 301.

The authors have systematically examined the suprarenals in the course of 90 autopsies performed during the war, and in 3 instances found traumatic lesions. In every case these lesions were associated with very severe traumatisms of other organs, and all were unilateral. The conclusions drawn from the observations were as follows:

1. Traumatic lesions of the suprarenals sometimes occur in violent traumatisms involving the dorsolumbar region or the abdominal walls.

2. The production of retroperitoneal hæmatomata is sometimes associated with hæmorrhagic lesions in the suprarenals.

3. In old persons who have been the victims of crushing accidents, the suprarenal may be the only abdominal organ injured.

In addition to the traumatisms, the authors observed 4 tuberculous lesions of the suprarenals in young soldiers who had died from wounds. The incidence of such lesions they believe is high. In one case the lesions were bilateral and death was probably hastened by suprarenal insufficiency.

One of the clinical characteristics of these cases had been the occurrence of repeated vomiting. From this fact the authors conclude that when vomiting is unexplainable by other causes a lesion of the suprarenals may be suspected.

W. A. BRENNAN.

**Goormaghtigh, N.: The Function of the Suprarenal Capsule in Man in the Normal State and in Infections, Particularly in Gas Gangrene** (Contribution à l'étude du fonctionnement de la capsule surrénale humaine à l'état normal et dans les états infectieux en particulier dans les gangrènes gazeuses). *Arch. de méd. expér. et d'anat. prat.*, 1919, xxviii, 277.

The authors have made detailed macroscopic and microscopic examinations of 70 suprarenal capsules removed from the bodies of soldiers from fifteen minutes to one hour after death. In some instances the men had died suddenly from acute anæmia, craniocerebral wounds, etc., and no morbid process was found in the bodies at autopsy. These suprarenals were considered as normal and used as controls for the others. Other suprarenals were removed from the bodies of men who had died of gas gangrene which had developed at various periods after injury.

The details of the examinations and a number of

photographs of the microscopic tissue sections are given.

It was found that the suprarenal capsule in man reacts against infection by its two constituent glands. The part played by each gland is described.

Between the development of gas gangrene and the morphologic and functional alterations of the cortical gland there is a complete parallelism. The parallelism as regards the medullary changes is less marked.

The cortex is more frequently the site of pathologic lesions than the medullary substance. Suprarenal insufficiency in gas gangrene is especially an insufficiency of the cortical gland.

Treatment should consist in the administration of extracts from the whole suprarenal gland.

W. A. BRENNAN.

**Stevens, W. E.: Some Interesting Surgical Conditions of the Kidney and the Prostate.** *California J. Med.*, 1919, xvii, 82.

Stevens claims that because in most statistics the ages of the patients vary from 15 to 40 years, the impression is general, even among the urologists, that tuberculosis of the kidneys is uncommon in children. This idea, he insists, is erroneous and arises from neglect to examine the urine of children for tubercle bacilli and disregard of the more modern diagnostic aids.

The cystoscope can be used in male children as young as 16 months and in female children as young as 14 months. The ureters have been catheterized in male children under 3 years of age and in female children 22 months of age.

Two cases of the removal of tuberculous kidneys from children are reported, those of a girl of 9 and a boy of 13 years of age. Emphasis is placed on the importance of early examination of the urine of every child with urinary disturbances for the presence of tubercle bacilli.

As an instance of renal reñex, the author reports the case of a man, 38 years of age, who complained of pain in the right lumbar region and the upper and lower right abdominal quadrants. Radiography and pyelography revealed the shadows of two calculi in the upper pole of the left kidney. Following the removal of these calculi, the pain in the right side disappeared.

Also reported is the removal of a prostatic calculus weighing over 50 gms. which the author believes had formed primarily in the upper urinary tract and increased in size in a pouch or diverticulum of the prostatic urethra where it had lodged.

An enlarged prostate weighing 256 gms. is described.

LOUIS GROSS.



**Judd, E. S., and Harrington, S. W.: Ectopic or Pelvic Kidney.** *Surg., Gynec. & Obst.*, 1919, xxviii, 446.

Nineteen cases of renal ectopia recorded at the Mayo Clinic have made possible a study of the relative frequency, anatomic variations, clinical features, diagnosis, and treatment of the abnormality.

Because of its rarity, renal ectopia or congenital misplacement of the kidney, has been of interest to the anatomist for centuries. Lately, because of the association of genital malformation with, and the development of pathologic conditions in, the ectopic kidney, it has been brought for correction and treatment to the surgeon. Gerard finds the abnormality only once in about 2,500 persons, and in 121 clinical cases reviewed by Dorland, the displacement or disease in the kidney caused clinical symptoms in only one third. Occasionally, if the kidney is functionally impotent because of its location, the surgeon alters its position, but if the cause of the trouble is pathologic, he treats it as he would the normally placed organ.

The ectopic kidney presents some distinct anatomic features. It is usually of average size, although it may be small, and its oval or pyramidal shape depends on the surrounding structures. The origin of its very liberal vascular supply is, as a rule, in the lower few inches of the aorta. Its arterial and venous supply often do not correspond. The ureter is generally comparatively short, but as it takes the most direct course to the kidney, it enters at the normal position. The pelvis of the kidney, which is not always developed, and the ureter are usually on its anterior side and therefore retain their fetal relationship. Although it may become movable from trauma or pregnancy, the ectopic kidney is usually firmly fixed by its vascular pedicle within the small pelvis behind the uterus where it may be found at one side resting on the promontory of the sacrum or sacro-iliac joint, in the iliac fossa, or, rarely, in the abdominal wall. It is situated on the left side much more often than on the right and is usually on the side where it normally belongs, although it may be one of crossed ectopic kidneys. Genital malformations, imperfect development, entire absence of the uterus and vagina, vulvar or urethral openings, and atrophic and undescended testicle, if unilateral, are found on the same side as the ectopic kidney.

The same clinical symptoms which suggest a pathologic condition of the normally placed kidney, are suggestive also of a pathologic condition in the pelvic kidney, although appendiceal inflammation in males and pelvic disorders in the female adnexa are frequently misleading. Because of their predisposition to pelvic disturbance, more cases of ectopic kidney are observed during life in women than in men, but necropsies show that the incidence of the condition in both sexes is the same.

The presence of an ectopic kidney is suggested by the palpation of a mass through the abdominal

wall, the absence of the kidney from its normal position, the absolute and relative fixation of the tumor mass, the palpation of the lobulations of a kidney, the depression of the hilus, the pulsation of a large artery on the anterior wall of the kidney, and genital malformation associated with pelvic tumor. The diagnosis depends on cystoscopic and pyelographic examinations and is finally determined by pulsation in the trigone from an underlying large renal artery, a short ureter, the abnormal position of the pelvis, the presence of stones, and the pathologic condition of the organ.

The surgical treatment of the ectopic and the normal kidney is essentially the same. If the kidney is functioning normally there is no reason to disturb it. Symptoms suggestive of intermittent hydronephrosis, however, lead the surgeon to attempt changing the position of the pelvic kidney. If it interferes with pregnancy, he may be able to raise it above the brim of the pelvis, although, because of the fixity of its blood vessels, a cesarean section in the last stages of pregnancy may be preferable. Nephrectomy is indicated in all cases of destruction of kidney tissue, but should not be considered until the surgeon has made sure that the opposite kidney is normal instead of missing as in some cases of renal ectopia.

As in the 19 cases of ectopic kidney observed in the Clinic operation was performed in only 9 for some pathologic condition and the others were discovered only during routine examination or operation for some other trouble, this report agrees with statistics which record the abnormality as clinically and pathologically unimportant in the majority of cases.

**Grégoire, R. and Marsan, F.: Pyelonephritis Without Kidney Wound in War Injuries** (*La pyélonéphrite sans plaie du rein chez les blessés de guerre*). *J. d'uroł. méd. et chir.*, Par., 1918-1919, vii, 425.

The authors observed kidney infection in three wounded soldiers who showed no kidney traumatism. The first case was a thigh injury; the second, purulent arthritis of the knee necessitating amputation; and the third, injuries principally in the sacrolumbar region.

Pyelonephritis as observed in the three cases reported is not a frequent complication of war injuries. These were the only cases seen by the authors in their war experience, and they believe that, owing to their routine practice of examining the urine, any others would not have escaped their notice. The rarity of the condition is due to the integrity of the organs in these young and otherwise healthy subjects. When pyelonephritis is observed in connection with a war injury elsewhere than in the kidney region, the resistance of the kidney region has generally been diminished by some previous infection. The gravity of a wound elsewhere does not determine the kidney lesion, and where infection occurs, as in the case reported,



the route of infection is by the blood. Such infections are usually bilateral unless there is a special predisposition in one kidney alone. Usually also they are benign in their evolution. Of the three patients two made normal recoveries. One patient died but death was not due to the kidney lesion, which was found only at autopsy.

Pyelonephritis associated with war lesions may be present for a long time unperceived and simulate purulent retention or septicæmia. The urine should be examined whenever the condition of a wound does not explain the patient's symptoms.

W. A. BRENNAN.

**Rovsing, T.: Diagnosis and Treatment of Renal Calculi on the Basis of 25 Years' Personal Experience** (Om Diagnosen og Behandlingen af Nyresten paa Grundlag af fem og tyve Aars personlige Erfaringer). *Hosp.-Tid.*, 1919, lxii, 1.

Rovsing's article is a resumé of his twenty-five years' work in the diagnosis and treatment of kidney calculi since he performed his first nephrolithotomy in September, 1893. The total number of patients treated was 533. One hundred and eighty-five of these had apparently a hæmatogenous infection and 348 were aseptic cases. Of the latter, only 221 were operated upon.

Usually there were no symptoms from the stone until pain or hæmaturia directed attention to it. In the causation of kidney stone an important rôle is attributed to an unbalanced diet.

Gravel and small stones are usually passed spontaneously and do not require an operation. In the case of one patient who had had several attacks of ureteral colic and had passed gravel, the presence of a stone in the kidney had never been detected by radiologic examination.

Phosphaturia may be associated with the formation of large concretions. The majority of phosphatic kidney calculi are due to accidental or artificial phosphaturia caused by the prolonged drinking of mineral waters perhaps taken to combat the very condition which they increase.

The symptoms of kidney stones may simulate those of appendicitis, etc., and vice versa. Therefore a careful differential diagnosis must always be made.

The hæmaturia may be found only by microscopic examination. Both kidneys and ureters should be carefully examined radiographically. A calculus may be present in an apparently sound kidney. On the other hand, the radiographic findings may be quite negative while the clinical and catheter findings are very positive. Examples of such cases are given. Phosphatic and urate calculi cast only slight shadows and their detection, especially in the obese, may be impossible. In 32 of 195 cases in which calculi were found at operation the X-ray findings had been negative and in 6 other cases had been misleading.

For the treatment of nephrolithiasis Rovsing advises the copious drinking of distilled water which

washes the kidneys and does not leave any deposit. The stone will be affected only when it is a urate or an oxalate and small in size. Even in the case of patients who are to be operated upon, however, such treatment is advantageous when there is infection. Unless a case is very urgent, Rovsing always puts his patients upon this distilled-water régime to get rid of toxins and bacteria. It may also transform an inoperable, into an operable, case, or keep the patient in a good condition without operation for a long period. One of his patients who has a large kidney stone has been treated in this way for twenty-five years.

After operation the drinking of distilled water is continued. The author believes it is particularly important in cases of uric acid diathesis.

In 221 of his cases the urine was bacteria-free. In the infected cases *B. coli* was the organism most frequently discovered.

In 58 cases bilateral calculi were found and in 63 cases calculi were present in the ureter. In 10 cases there was anuria. Of the 533 patients, 295 were operated upon as follows: Nephrolithotomies, 202; pyelolithotomies, 8; nephrectomies, 55; and ureterolithotomies, 30. There were 29 deaths, a mortality of 13 per cent.

W. A. BRENNAN.

**Presno y Bastiony, J. A.: The Operative Indications in Bilateral Ureterorenal Lithiasis** (Indicaciones operatorias en la lithiasis bilateral ureterorenal). *Rev. de med. y ciruj de la Habana*, 1919, xxiv, 93.

The author gives the clinical history of a case of lithiasis of the right ureter associated with calculus in the left kidney. The patient was a woman 26 years of age. Extraperitoneal ureterolithotomy followed by pyelotomy and pyelostomy was performed. The renal calculus removed weighed 64 gms., and the ureteral calculus, 6 gms. The patient recovered without the development of any type of fistula.

In order to obtain every possible assistance in the diagnosis of urinary lithiasis complete radiographs must be made. In the case reported the renal calculus caused no symptoms and was discovered only in this way. In many instances radiography has demonstrated the presence of bilateral lithiasis when clinically the calculi appeared to be located on only one side.

The practice recommended by Albarran and Legueu of operating in bilateral lithiasis on the healthiest side first the author believes is correct in cases of double renal calculus but not always correct in bilateral reno-ureteral calculus. In these cases the extraction of the calculus in the ureter is the most urgent.

Drainage by the renal pelvis or pyelostomy, though not generally employed, is a simple form of treatment which cures without leaving fistulæ. Pyelotomy as its preliminary operation does not destroy the integrity of the renal parenchyma.

W. A. BRENNAN.



**Covisa, I. S.: Neoplasms of the Kidney and of the Renal Pelvis** (Algunos casos de neoplasias del riñon y de la pelvis renal). *Rev. españ. de cirug.*, 1919, i, 2.

In reporting three cases of renal neoplasm the author discusses the symptomatology of the condition at length. The cardinal symptoms are a palpable tumefaction, renal pain, and hæmaturia. In general, the co-existence of these is sufficient for the diagnosis of tumor but in some cases it is necessary to differentiate between renal tuberculosis, lithiasis, and hydronephrosis.

Hæmaturia is the most frequent symptom of renal tumor but is not absolute. The pain arising from a neoplastic process has nothing special to characterize it from that due to any renal tumefaction. When severe and constant, it simulates that of large renal calculi. Sharp and violent crises of pain accompanied by the expulsion of coagulum are similar to those due to the passage of a calculus through the ureter. For the diagnosis of tumor, analysis of the urine is very important as especially urea and the chlorids are reduced in the urine from an affected kidney. In addition, the presence in the sediment of remnants such as neoplastic cells gives an indication of the character of the tumor and are of as much pathognomonic significance as the finding of the Koch bacillus in tuberculosis or the echinococcus in hydatid cysts disrupting into the renal pelvis.

Clinically there are two groups of renal tumors, those found in children and those which occur in adults. The former, which are glandular, embryonic, sarcomatous tumors, are characterized by their appearance before the fourth year of age and their rapid growth without hæmaturia or metastases. The latter, which are associated with hæmaturia and metastases, are usually seen between the thirtieth and fortieth years of age and are of slow growth. This group includes hypernephroma, carcinoma, and sarcoma. Hypernephroma is the most frequent and develops more slowly than carcinoma or sarcoma. Sarcoma causes more rapid and marked cachexia.

W. A. BRENNAN.

**Rossi, F.: Three Cases of Malignant Kidney Tumors in Young Children** (Sopra tre casi di tumore maligno del reno in bambini). *Rev. di clin. pediat.*, 1918, xvi, 617.

Neoplasms of the kidney are rarely observed in infants. The classical syndrome which in adults consists of tumor, pain, and hæmaturia, in the child is represented principally at first by increased volume of the kidney, the other symptoms of malignant neoplasm coming later. Hæmaturia is inconstant and the symptoms of pain untrustworthy or lacking. Generally speaking, a kidney tumor in a young child is discovered only when the child is treated for some other condition.

The author gives the clinical histories of 3 cases, one that of a child 8 years of age and 2 those of children 2 years of age. All of the tumors were

sarcomata and were operated upon. In the first case, owing to the enormous size of the tumor and adhesions, it was not possible to remove the entire growth. The child died some weeks later. The other two patients recovered, one of them definitely. The other was still under observation two months after operation.

The mortality in non-operated cases of kidney tumor in young children has been 100 per cent. The operative mortality fell after 1880 to 52 per cent, and since 1890, owing to improved technique, has been reduced, according to Heresco's statistics to 17 per cent, and according to Lecène's statistics, to 12.44 per cent. The brilliancy of the improvement, however, has been dimmed by the fact that there were 88 per cent of recurrences (Albarran and Imbert): While many surgeons, therefore, are doubtful as to the value of intervention, Albarran, Israel, Kocher, Hartmann, Concetti and others continue to operate whatever the age of the patient or the nature of the tumor. Very young children stand a long operation well.

The only definite recovery among 14 patients operated upon in the pediatric clinic of Rome was that of a child 11 months old.

In view of the fact that the mortality in non-operated cases is 100 per cent, the author believes that failures and recurrences ought not to discourage surgical intervention. When the diagnosis is made early in the disease the indication for operation is imperative.

W. A. BRENNAN.

**Goyanes, I.: Ureterostomy as an Operation of Urgency** (La ureterostomía como operación de urgencia). *Rev. españ. de cirug.*, 1919, i, 65.

The author operated upon a woman for an immense ovarian tumor. The tumor was removed and a hysteromyomectomy done with ligature and lateral section of the ligament and uterine arteries. The freeing of the bladder was very difficult. To stop the hæmorrhage it was necessary to place continuous catgut sutures in the anterior and lateral walls of the vagina.

On the third day, owing to the persistence of postoperative anuria, it was decided to operate again at once. As it was assumed that the ureters had been included in the suture of the anterior vaginal wall, and as difficulties would be met in liberating the ureters by an abdominal route, a lumbar incision was made in the right flank. Incision into the ureter, which was enlarged, then gave issue to a strong flow of urine through the wound. When a sound was passed through the incision a distance of some 20 cms. the ureter was found blocked by a periureteral ligature about the bladder.

During the first twenty-four hours following, about 4 liters of urine were withdrawn by the catheter from the right ureter. Cystoscopy and examination on the fifth day after the first operation showed that both ureteral orifices were blocked by the catgut sutures about the bladder. The urine



was drawn off by the lumbar wound but on the fifteenth day, when the catgut sutures had become resorbed, spontaneous and voluntary micturition by the urethra became re-established.

The author concludes from this case that total bilateral obliteration of the ureters can be supported for a period of sixty hours with only slight discomfort due to the distension of the renal pelvis and capsule, and without symptoms of uræmia.

By the elimination of the urine through the ureteral fistula the right kidney functioned perfectly and assumed also the function of the left kidney.

Para-ureteral ligature does not necessarily cause permanent occlusion of the ureter or its rupture with the formation of urinary abscess or infiltration.

By the elimination of urine through the fistula of the right ureter the left kidney supported occlusion of its ureter for fifteen days.

Ureterostomy with drainage of the kidney pelvis was in this case an operation of urgency and saved the patient's life. There was complete restitution of function.

The essential difference between the author's case and those in which the ureter is opened for the delivery of a ureteral stone lies in the fact that in the latter the obstruction disappears with the operation whereas in the former continued catheterization of the renal pelvis was necessary.

W. A. BRENNAN.

#### BLADDER, URETHRA, AND PENIS

**Legueu, F.: Azotæmia in Urinary Retention** (L'azotémie des rétentionnistes urinaires). *Presse méd.*, 1919, xxvii, 141.

In addition to the fixed or slowly increasing azotæmia which accompanies chronic Bright's disease, the surgeon observes other types of varying degree, such as postoperative azotæmia and the azotæmia which occurs especially in cases of urinary retention. The latter, although chronic, are often curable as they are dependent upon urinary retention alone. It is of this type that Legueu treats.

The cases are cited of several patients with very high azotæmia who were cured by treatment of the vesical retention alone, i. e., by regular and frequent evacuation of the bladder. Legueu believes that those who are most disposed to high azotæmia are persons whose retention is incomplete. Complete retention demands relief but in incomplete retention the necessity of regular evacuation of the bladder is disregarded.

A large number of patients who are not correctly treated or treated too late die of renal insufficiency. When retention is not of long standing and the urinary complications have not become definite, repeated catheterization re-establishes regular bladder function.

In cases of retention the condition is due to vesical pressure and not to any definite lesion of the renal parenchyma.

The knowledge that azotæmia of this type is generally curable is of great practical importance in regard to prostatectomy. A patient with retention who has marked azotæmia is much more apt to stand the operative traumatism than a patient who does not have it as the toxins have been completely removed before operation. Removal of the toxin should therefore be the first step in the operation, and even in moderate azotæmia the indication for such pre-operative treatment is definite.

W. A. BRENNAN.

**Jacobs, L. C.: Diagnosis and Treatment of Glandular Obstruction at the Neck of the Bladder.** *California St. J. Med.*, 1919, xvii, 56.

There are certain glandular enlargements within the posterior portion of the sphincteric orifice of the bladder which produce anatomic changes and decided symptoms. Jacobs reports the histories of two cases cured by fulguration.

Lowsley, in his original research, found a number of tubules in the posterior urethra which have a tendency to hypertrophy and grow within the sphincter. These he designated as subcervical glands or glands of Albarran.

In the majority of the author's cases there was a small bulging of the lower border or floor of the sphincter in the median line, some deformity of the trigon, and a prominent interureteric ridge close to and in back of the trigon. This swelling was small, regular in outline, and without lateral enlargement, making it appear that there was a depression on both sides. There was also an abrupt declivity into the posterior urethra and an enlarged verumontanum.

Jacobs uses the d'Arsonval current of about 300 milliamperes, with the spark-plug regulated to 3 milliamperes in length. This gives a fairly strong current and is not painful. With the McCarty cysto-urethroscope a small insulated electrode is inserted, and continuous irrigation is used. The entire procedure takes but a few minutes, no anæsthesia being required. In some cases it is necessary to fulgurate two or three times at intervals of two weeks. In two of his cases there was a recurrence, one six months later, the other one year later.

The author's conclusions are as follows:

1. There are a number of median bar obstructions at the neck of the bladder of the glandular variety.
2. These are either an enlarged median lobe of the prostate or Albarran's glands.
3. All patients with this condition can be relieved and the majority of them cured by means of the fulgurating current.

LOUIS GROSS.

**Pasteau, O.: Traumatic Lesions of the Deep Urethra** (Les lésions traumatiques de l'urètre profond) *J. d'urol.*, Par., 1918-1919, vii, 407.

In the treatment of war wounds of the deep urethra at the base hospitals, a cystostomy is per-



formed if it has not been done already, and the perineal wound thoroughly drained. Suture of the perineal wound is avoided. The torn ends of the urethra are then placed in alignment and a permanent catheter inserted. Later on, the perineal area is widely opened up. This area and any fistulous tracts are explored and left open for a long time, the cystostomy opening also being maintained. Pasteau considers this the best procedure for the prevention or treatment of urethral strictures due to deep urethral injuries.

W. A. BRENNAN.

**Le Fur, R.: Bullet Wound of the Gluteal Region and Pelvis with Extensive Rupture of the Urethra** (Blessure par balle de la fesse et du bassin avec rupture étendue de l'urètre). *Paris chirurg.*, 1918, x, 313.

The soldier whose case is reported by Le Fur had 11 successive operations as follows: (1) hypogastric section with right castration for retention of urine following a rupture of the urethra and pelvic fracture caused by a bullet which entered the gluteal region and came out through the right scrotum; (2) retention catheterization to re-establish the continuity of the urethra; (3) drainage of a large perineocruroscrotal abscess with removal of bone fragments in the left ischiopubic region; (4) resection of the left hip for chronic purulent arthritis with lesion of the head and neck of the femur; (5) arthrotomy for purulent arthritis of the left knee; (6) evacuation of an enormous purulent collection in the right hip; (7) complementary arthrotomy of the left knee with counter openings in the thigh; (8) evacuation of a collection in the left thigh; (9) evacuation of an enormous abscess in the right arm; (10) vesical autoplasty for hypogastric fistula; and (11) lithotripsy for secondary calculi in the bladder.

Le Fur says that this case shows that we ought never to despair, for the patient who was several times considered lost is now in excellent condition.

The case is of particular interest also because, as far as is known, it is the only case reported of purulent arthritis of both hips complicated by purulent arthritis of the knee.

The treatment and the results show that hip resection is infinitely superior to ankylosis of the hip such as is observed after drainage or arthrotomy. Both hips were not resected in this case because the patient's condition would not permit it. The resected limb, even if weaker in its supporting power, gives a better functional result as regards walking than the ankylosed limb, and greater freedom of movement.

W. A. BRENNAN.

## GENITAL ORGANS

**Judd, E. S., and Crenshaw, J. L.: Prostatic Calculi.** *Minn. Med.*, 1919, ii, 52.

In 3,180 cases of prostatic conditions there were 20 cases of prostatitis in which true prostatic cal-

culi were found, and 11 cases in which it was necessary to operate for the removal of false prostatic stone. These are reported.

Prostatic calculi are divided by the authors into three groups. Two of these groups comprise true prostatic stones as they are formed in the substance of the gland. The third group includes stones which are formed elsewhere, usually in the kidney, sometimes in the bladder, possibly in a diverticulum of the urethra, and passed into the prostatic urethra. These are known as false stones. In Group 1 are placed cases of true calculi in which the stones are the result of peculiar forms of prostatitis. They arise from the acini of the ducts of the gland and may attain considerable size. These have as a nucleus the concretion and sediment of the prostate gland which are usually covered by layers of phosphates. There may be some urates as well. Lund says that hard microscopic bodies called "corporea amylacea" form in the prostate at any age. They consist of sediment from the prostatic secretion and at times become the nuclei of stones composed of lime, the triple phosphates and bicarbonate of lime from the outer coats. Prostatitis is the important feature, the stone formation probably being secondary. The stones are generally distributed throughout the gland, but may occur in isolated pockets outside the gland in front of the rectum.

The treatment of all types of prostatic calculi is to remove the stones and remedy the associated condition. In some cases massage and irrigations relieve. The transvesical operation is recommended.

I. KOLL.

**McKillop, L. M.: An Improvement in the Technique of Perineal Capsuloprostatectomy.** *Med. J. Australia*, 1919, i, 48.

The author first distends the bladder and then makes the ordinary suprapubic incision down to the bladder. This space is then packed with a large gauze sponge and the patient placed in the lithotomy position. The usual curved transverse incision is next made across the perineum and deepened until the perineal muscles are met. The plane of cleavage between the rectum and the bulb is sought and opened up. It will then be found that the prostate gland is lying low in a most accessible position.

The dissection is further deepened until the false capsule is exposed, and continued externally to that structure. Counter pressure is then made over the hypogastric swab until the prostate is pushed down almost flush with the perineum, when the subsequent steps are carried out under the guidance of the eye. The bleeding, which in these cases is usually a source of much danger, can be controlled with the greatest ease. The puboprostatic and the lateral true ligaments of the bladder are cut through, and with a little care the finger is hooked above the pelvic fascial capsule, the gland being separated from the base of the bladder outside of the internal sphincter.



When further separation is impossible, the bladder wall is cut through in a circular manner. The vasa deferentia and the membranous urethra, with its contained catheter, are then completely divided and the prostatic capsule and its gland removed *in toto*. A fresh, large-sized catheter is then passed down the urethra to replace the one that was divided. The new catheter is guided into the bladder. All bleeding points are very carefully caught and ligated, and the redundant portion of the bladder wound closed with catgut, care being taken to avoid catching up the bladder mucosa. A gauze drain in a split tube is then introduced down to the base of the bladder. Iodoform gauze is packed firmly about this, and the lateral portion of the transverse perineal wound united by silk-worm-gut sutures. The stitches are then cut in the abdominal wound, the gauze sponge is removed, a small drain inserted into the prevesical space, if necessary, and the remainder of the wound closed in the usual way.

As would be expected, there is more or less incontinence after this operation, but in view of the fact that it is done for a desperate condition, this is not surprising. In any case, it is no more inconvenient than the terminal suprapubic cystotomy usually demanded in these cases of malignant disease of the prostate. In the author's opinion, the extra trouble of making an incision in the abdominal wall is more than compensated for by the splendid exposure obtained and the ease with which the hæmorrhage can be controlled.

V. D. LESPINASSE.

**Oraison, I.: Simultaneous Cancer of Both Testicles** (Cancer simultané des deux testicules). *Gaz. hebdomadaire de médecine de Bordeaux*, 1919, xl, 33.

Oraison's case of simultaneous cancer of both testicles was that of a man 50 years of age who, early in 1918, suffered a testicular traumatism. Some months later, when he had apparently recovered

entirely, he made a journey of 15 kilometers on foot. Immediately afterward his right testicle became swollen but not painful. This swelling increased and similar changes in the left testicle soon followed. The patient was put to bed and treated locally for two months. After a thorough examination, operation was decided upon but diagnosis was reserved. In the region of the left testicle the vaginalis was filled with fluid and a testicular neoplasm was found involving the cord. The condition on the right side was similar. The tumor on the left side was removed, but the growth on the right was left *in situ* owing to the patient's condition.

Histologic examination of the tumor removed showed it to be an epithelial neoplasm having its origin in the seminal vesicles.

The points of interest in the case are the bilateral position of the tumor which arose from a traumatism and the rapidity of its development (3½ months). Most testicular neoplasms are sarcomata.

W. A. BRENNAN.

**Sacco, A.: Orchivovesiculectomy in Renal Tuberculosis** (Orquivovesiculectomía en la tuberculosis renal). *Semana médica*, 1919, xxvi, 188.

Sacco gives a detailed review of the surgical treatment of tuberculosis of the seminal vesicles for the past 27 years, since Villeneuve first performed vesiculectomy in 1890.

In a small series of 8 cases treated by the author there were 33 per cent of failures among those upon whom simple castration was performed and 100 per cent recoveries among those treated by orchivovesiculectomy. These cases have been followed for a year or more.

Although different methods have been used by other surgeons, none has reported 100 per cent of permanent cures. In the author's opinion the more practical the operation the better the end results.

W. A. BRENNAN.

# SURGERY OF THE EYE AND EAR

## EYE

**Pringle, J. A.: Three Cases of Gas Infection of the Cornea Following Gunshot Wounds of the Eye.** *Brit. J. Ophthalm.*, 1919, iii, 110.

The writer is unable to find any record of gas gangrene of either the face or the eye and concludes that the immunity of these parts is due to their extremely good blood supply, the fact that dirty clothing is not carried into the wounds with the fragments of metal, and the fact that the conjunctival sac is not a favorable site for the development of anaerobic organisms.

The cornea being nonvascular and susceptible to interference with its circulation, the organisms of gas gangrene should there find favorable conditions for growth.

Three cases were observed by Pringle in which after severe injury the cornea was rapidly involved. In the last case the upper one-third became infiltrated in forty-five minutes. Actual formation of the gas bubbles was observed in the cornea but not in the surrounding tissues. The organisms isolated were those usually found in infected war wounds and a few forms suggestive of vibrios septique.

S. S. HOWE.

## EAR

**Cutler, F. E.: Injuries of the Auditory Canal Resulting from Projectiles, with Special Reference to the Separation of the Cartilaginous from the Bony Canal.** *Laryngoscope*, 1919, xxix, 82.

Cutler points out that injuries to the external auditory canal, while fairly rare in civil practice, are rather common in modern warfare.

Such injuries he classifies as follows: (1) Injuries to the bony canal; (2) injuries to the cartilaginous-membranous canal; (3) injuries to the membranous, cartilaginous and bony canal; and (4) separation of the cartilaginous-membranous canal from the bony canal.

The treatment instituted for these various lesions and their complications at the Royal Hospital in Vienna is reported, and a detailed description given of a skin-flap operation devised by Erich Ruttin for the repair of the membranous canal.

J. J. HOMPES.

**Levy, L.: Vestibular Reactions in 541 Aviators.** *J. Am. M. Ass.*, 1919, lxxii, 716.

The amount of flying which had been done by the men examined varied from that of cadets who had just begun to that done by officers who had flown one thousand hours.

The data was collected in answer to statements in several articles that repeated stimulation, such as experimental turning or flying, lessens the reactions.

It was found that nystagmus is not diminished by repeated turnings. Although vertigo was not timed, past-pointing and falling were slightly diminished in those who had flown one hundred hours or more, being most noticeable in the flyers who had flown the most. As past-pointing and falling are objective signs of vertigo, this diminution was due to the fact that the flier had learned to interpret the vertigo and more rapidly recovered his poise.

J. J. HOMPES.

**Stickney, O. D.: Report of a Case of Bilateral Acute Suppurative Otitis Media with Symptoms of Sinus Thrombosis.** *Laryngoscope*, 1919, xxix, 90.

The author reports in detail the case of a woman, 52 years of age, on whom he performed a double mastoidectomy for bilateral streptococcic mastoiditis. The mastoid symptoms were complicated for several days previous to the operation by septic temperature and several distinct chills, one of which lasted for eight minutes. There was a leucocyte count of 16,000 and pain in the right arm and left ankle. On the day of the operation the patient was completely unconscious. A tentative diagnosis of sinus thrombosis was made. At operation both lateral sinuses were well exposed but appeared so normal that only sterile hypodermic punctures were made above and below in both of them. Cultures from the sinuses were negative. Following the operation, the temperature did not return to normal. Five days later an incision made in the right elbow, which was swollen, released one ounce of pus. Cultures of this pus gave the same streptococcus as that recovered from the mastoids. A swollen left ankle was also incised but in this case no pus was found.

In spite of the drainage established by the several operations, the chills, temperature, and pain in the head and the general symptoms of sinus thrombosis continued. As the cause seemed to be in the right sinus, the jugular vein was then ligated. No thrombosis being found, the left sinus was incised. There was a free flow of blood which was stopped by iodoform packs.

The author is satisfied that in this case both veins were so obstructed that no blood could pass through them and that the absence of brain symptoms was due to the fact that the return flow of blood from the brain was well taken care of by the collateral circulation. The patient completely recovered.

J. J. HOMPES.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Cohen, L.: Bone and Cartilage Grafting in the Correction of External Deformities of the Nose.**  
*South. M. J.*, 1919, xii, 151.

Cohen discusses various phases of bone and cartilage grafting in the correction of external deformities of the nose, adding 5 case reports with photographs of the patients before and after operation.

In regard to the question as to whether it is better to use bone or cartilage, the author lays down the sensible proposition that where bone existed formerly bone should be preferred, and where cartilage existed formerly cartilage should be used.

Rib transplant is preferred to tibial transplant because, in the author's experience, the latter has not grown fast to the underlying bone. The method in obtaining and placing the graft is as follows: "After exposing the seventh or eighth rib by the usual incision, a section 3 to  $\frac{1}{4}$  in. wide and of the necessary length is taken from the center of the outer table down to the diploic structure with a sharp, narrow chisel, and a strip of cartilage slightly wider and thicker, from the adjoining costal cartilage, care being exercised not to break the connection between the two portions."

Cohen invariably retains a periosteal and perichondrial covering on the side of the transplant which is to come into contact with the skin. The subcutaneous method of placing the graft is preferred, i.e., through incisions within the vestibule of the nose.

The following rules are necessary for success:

1. Prevent infection by careful asepsis of the field from which the graft is taken and that to which it is transferred, never allowing the graft to touch the skin edges during manipulation.
2. Avoid handling implants with the fingers, gloved or ungloved, but hold them with sterile forceps or some other suitable instrument which has not been used during the operation for any other purpose.
3. The recipient wound should be freed of all blood clots, and active bleeding should be stopped before planting the graft.
4. The surgeon must be certain that the under surface of the graft is in contact with bone freed entirely of periosteum.
5. In cases of septal abscess no attempt at grafting should be made until three months after all active suppuration has ceased.

When there has been septal suppuration, it is necessary to furnish some substitute at the lower end of the dorsal graft. When the septal mucous membrane is intact, it is the author's custom, before

etherizing the patient, to separate these membranes under local anæsthesia as if for a submucous resection, thus preparing a bed for a thin section of rib cartilage extending from the anterior nasal spine up to the dorsal graft. The patient is then at once etherized and the grafting operation completed. This septal implant, if properly shaped, will also give support to a flaccid columna. Should a perforation in the mucous membrane make the septal graft impossible, a narrow strip of cartilage placed in each ala nasi, one end resting on the maxilla and the other against the dorsal graft, will furnish satisfactory support.  
O. M. ROTT.

**Harris, T. J.: Report of a Case of Meningitis Following Operation Upon the Middle Turbinate, with Autopsy Findings Showing an Old Perforation of the Cribriform Plate of the Ethmoid.** *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxvii, 1241.

Harris reports a death from pneumococcic meningitis at Fort Oglethorpe following the removal of a cystic middle turbinate by means of the cold snare. The patient gave a history of having sustained a fracture of the nose twelve years before which had incapacitated him for two weeks at that time but had caused him no trouble since.

The diagnosis made on microscopic examination of the tissue removed at operation was acute phlegmonous rhinitis superimposed upon chronic hypertrophic rhinitis. The postmortem findings showed that the contributory cause of death was operation upon cystic degeneration of the middle turbinate complicated by failure in the formation of the cribriform plate of the right ethmoid bone on the side operated upon.

When the brain was removed it was noted that the anterior lobe of the cerebrum was adherent to the cribriform plate of the ethmoid of the right side. The fact that some of the brain structure was torn in the removal indicated that the condition was chronic. In the middle portion of this cribriform plate was an opening 5 mm. in diameter with a necrotic center. This necrosis included the dural covering. In the opinion of the pathologist there was little doubt but that the perforation in the plate had existed since the time of the injury twelve years before and that there was probably a direct communication between the cystic turbinate and the brain.

Another case seen recently at Camp Lee in the service of Major E. W. Day is also reported. In this instance the postmortem examination showed the presence of an old necrotic cribriform plate and gave evidence that a localized meningitis had existed before operation.

In a similar case of his own the patient was operated upon under general anaesthesia. He took the anaesthetic very badly and after its administration never regained consciousness. The next morning he passed into convulsions and later lapsed into coma in which he died on the third day from cerebrospinal meningitis. A few moments after death a thin stream of cerebrospinal fluid escaped from the cribriform plate on the side operated upon. The two other cases here reported and those in the literature lead the author to the conclusion that this last patient had a latent meningitis at operation and that in every instance most extreme care should be taken in operating on the middle turbinate.

J. J. HOMPES.

### THROAT

**Harris, T. J.: Ankylosis of the Crico-Arytenoid Articulation, with Report of a Case Presenting Involvement of Both Joints and Requiring Tracheotomy.** *Laryngoscope*, 1919, ccic, 139.

A case is reported of bilateral crico-arytenoid ankylosis which, when compared with other cases reported in the literature, leads the author to the conclusion that it is reasonable to assume that the condition may arise from foci of infection located in any part of the body and especially in the upper respiratory tract. The pathology in this instance is the same as in other arthritides.

The development of an ankylosis of this kind is possible following prolonged paralysis from any cause or from erosion at the joint following local infection.

Early tracheotomy is advised when there is dyspnoea.

J. J. HOMPES.

**Iglauer, S.: Some Original Methods of Treatment of Laryngeal Stenosis.** *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxvii, 1233.

The author's method of treatment is dilatation by means of a rubber tube doubled upon itself. This procedure is based upon the well known effect of the continuous elastic pressure of rubber tubing in promoting the resorption of cicatricial tissue. It is pointed out that the method is applicable only to cases in which the patient is wearing a tracheal cannula or cases in which it is deemed best to perform a tracheotomy as part of the treatment.

The technique consists in passing a cord by way

of the opening in the trachea up and into the mouth by means of a metal carrier. The cord is then grasped and held by forceps, the carrier being withdrawn. One end of the cord is left hanging out of the mouth and the other end through the tracheotomy wound. By means of this cord a rubber tube of the proper size and sufficiently long so that when doubled on itself it will just reach from the arytenoids to the upper margin of the tracheotomy cannula can be drawn into place. The free ends of the tube are tied securely with another cord which extends out of the mouth and is secured to the cheek by adhesive plaster. This second cord not only aids in placing the tube in the trachea properly and removing it when it is necessary every few days, but collapses the ends of the tubing so well that an air-cushion effect is obtained.

By means of the tracheal cord, which is kept in place by winding it around the tracheotomy tube, other tubes of a larger size may be drawn into place without the use of the metal carrier. Also, intubation tubes with holes drilled at their distal ends may be inserted in the same way as soon as the stenosis has been sufficiently overcome. Thus the objectionable feature of the tubing, obstruction to oronasal breathing, is done away with as soon as possible. The intubation tubes are increased in size, padded and lengthened to reach the tracheotomy tube by slipping rubber tubing over them.

J. J. HOMPES.

### MOUTH

**Federspiel, M. N.: Dermoid Cysts Lying Within the Floor of the Mouth.** *Internat. J. Orthodont. & Oral Surg.*, 1919, v, 129.

Two cases are reported. According to Blair, dermoid tumors in the mouth occur either beneath the skin between the geniohyoglossus muscles or laterally below the angle of the jaw. In both of the author's cases the tumors had their origin between the geniohyoglossus muscles and were removed through a vertical incision extending from the chin to a little above the hyoid bone. In one case the teeth had been forced apart, but in the other there was no derangement of the dental alignment. During the operative procedure pressure was made upon the tongue and the tumor mass was forced through the separated muscles and easily removed by blunt dissection.

P. W. SWEET.



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## SURGERY OF THE EYE AND EAR

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## SURGERY OF THE NOSE, THROAT, AND MOUTH

### Nose

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# INTERNATIONAL ABSTRACT OF SURGERY

AUGUST, 1919

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Shawan, H. K.:** *The Principle of Blood Grouping Applied to Skin Grafting.* *Am. J. M. Sc.*, 1919, clvii, 503.

The present status of blood grouping may be stated briefly as follows: On the basis of the interaction of serum or plasma and red blood cells, every patient is placed in one of four groups. The classification followed by the author is that described by Moss.

Shawan's views are based on the observation of 26 cases of successful grafting with sections of skin from each of the four groups and autografts. Of 17 patients who were followed up, 2 were members of Group I, 8 of Group II, 2 of Group III, and 5 of Group IV.

Initial takes occurred independently of group compatibility, but permanent takes were modified by biological compatibility as follows: patients belonging in Group I grew skin from donors of each of the four groups equally well; those of Group II grew isogroup grafts and grafts from those of Group IV, while primary skin takes from donors of Groups I and III either shrank to minute size or entirely disappeared. In the course of time patients in Group III had permanent takes only of skin from the same group and donors belonging to Group IV. Permanent takes from the same group were obtained only in the cases of recipients who belonged to Group IV.

The article is concluded with the following summary:

1. Autografts grew best.
2. Isografts obtained from donors of the same blood group as the recipient or from donors of Group IV became permanent takes and grew almost, if not equally, as well as autografts.
3. When the donors and recipient were of different groups, isografts did not remain as permanent growths except when Group IV skin was used or when the recipient was a member of Group I.

4. Group I recipients grew permanent skin from donors of all of the four groups and apparently equally well.

5. Group IV skin grew permanently on recipients of all groups, but only Group IV grafts and autografts remained as permanent takes on Group IV recipients.

6. It appears that skin grafting obeys the principle of blood grouping as used in the transfusion of blood.

E. C. ROBTSHEK.

**Leriche, R.:** *Delayed Primary Suture in Several Stages in Extensive Osteo-Articular Traumatism* (De la suture primitive retardée en plusieurs temps dans les grands traumatismes ostéo-articulaires). *Lyon chirurg.*, 1918-1919, xv, 723.

Often in very extensive lesions it is not technically possible to suture the entire wound immediately even if it is clinically sterile. In such cases the suturing may be done in two or three stages, complete closure being obtained by about the seventh day.

Leriche gives the clinical histories of 3 cases of osteo-articular wounds dealt with in this way. The first suture was done two days after the primary intervention and included the deepest layer, the periosteum, synovial membrane, and deep muscles. Two days later the median layers were sutured, and two days following this the skin was closed.

From these cases it is evident that the method is quite safe, and that if the technique used is correct the presence of bacteria in the synovia, bone, muscle, or subcutaneous tissue will not cause any clinical complications. They show also the power of the organic defence. Although a serous synovial, or a weak hæmorrhagic, effusion is frequently observed after an arthrotomy, it is generally sterile, but perfect healing occurs even if cultures are positive. If the effusion is serous it distends the capsule and favors looseness of the joint. It is therefore advantageous to drain such effusions early.

The real benefit of early mobilization in certain



cases is due to the fact that the movements express the fluid from the joint. When the effusion contains blood and early mobilization is not applied a fibrinous clot is formed which may cause articular stiffness.

W. A. BRENNAN.

### ASEPTIC AND ANTISEPTIC SURGERY

**Mosti, R.:** Ether Disinfection, the Fowler Position, and the Permanent Murphy Drip as a Means of Preventing Acute General Peritonitis (La disinfezione colla etere, la posizione de Fowler, et la proctolisi permanente alla Murphy come mezzi preventivi delle peritonite acuta generalizzata). *Policlin.*, Roma, 1919, xxvi, sez. prat., 481.

Mosti believes that the use of ether lavage during a laparotomy prevents postoperative peritonitis. Since he has adopted this method of disinfecting the peritoneal cavity, in addition to the use of the Fowler position, permanent Murphy proctoclysis with physiological salt solution, and the apparatus devised by Galante, he has not observed any case of peritonitis in numerous laparotomies in which the serosa was contaminated by contact with gastro-intestinal contents or septic exudate.

W. A. BRENNAN.

**Baker, H. W.:** The Treatment of Infected Wounds with Dichloramine-T. *Am. J. Clin. Med.*, 1919, xxvi, 95.

The author reviews the work of Carrel and Dakin and the evolution of the Carrel-Dakin treatment. Objections to the treatment are that it requires specially trained assistants, the fluid is unstable and highly irritating to the skin, many dressings are necessary, and the apparatus is complicated and expensive.

Because of these objections, dichloramine-T, which was brought into the limelight by Carrel, was tried. The method of preparing dichloramine-T is described. It is used in solution with eucalyptol and chlorine or in paraffin wax. Under proper conditions these preparations can be kept for several months. Fresh wounds are swabbed with the dichloramine-T after the devitalized tissue has been removed and when so treated within the first six hours are stitched up without drainage.

A detailed description is given of the technique employed in using dichloramine-T in the treatment of compound fractures, cases of secondary suture, cellulitis, carbuncles, intra-abdominal infection, burns, skin-grafts, tuberculous wounds, empyema of the pleural cavity, mastoiditis, urethritis and diphtheria carriers.

I. E. BISHKOW.

### ANÆSTHETICS

**Regnault, J.:** The Question of Anæsthetics (La question des anesthésias). *Arch. de méd. et pharm. nav.*, 1919, cvii, 161.

Regnault gives a concise historical review of the development of anæsthesia. In his opinion, regional and local anæsthesia are of greater importance than general anæsthesia.

Of 764 minor and major surgical operations performed by the author in two years on board a hospital ship, four-fifths were done with regional anæsthesia. These included 31 pleurotomies, 480 operations for hernia, 33 appendicectomies, 53 operations for hydrocele, and 104 operations for varicocele, beside many performed upon the limbs. As a rule, the anæsthetic used was cocaine or novocaine.

W. A. BRENNAN.

**Sanders, E. M.:** Deaths During and Following Operations in Relation to the Surgeon, Anæsthetist, and Hazardous Risk. *Am. J. Surg.*, 1919, xxxiii, 43.

It is difficult to obtain the facts in regard to deaths which occur during anæsthesia as few of them are reported. The majority occur in private homes or small institutions. The causes are: carelessness or lack of skill on the part of the anæsthetist, experimentation with various anæsthetic mixtures, the administration of an anæsthetic in cases of hazardous risk, and poor judgment on the part of the surgeon in the selection of the anæsthetist, the anæsthetic, and the patient. In cases of shock, hæmorrhage, over- or under-dose of the drug, acute dilatation, acapnia, postoperative pneumonia, and acidosis, the cause is self-evident.

The remedy to prevent such fatalities is consultation, the skillful administration of only pure and safe anæsthetics, the careful preparation of the patient, the proper selection of heart cases, and attention to the blood pressure. The anæsthetist should be on the watch for danger signals, and the surgeon should be aided only by skilled anæsthetists and internists.

I. E. BISHKOW.

**Oliva, C.:** The Influence of Repeated Ether and Chloroform Anæsthesia Upon the Numerical Variations in the White Corpuscles (Influenza dell'anestesia eterea e cloroformica ripetuta sulle variazioni numeriche dei globuli bianchi). *Policlin.*, Roma, 1919, xxvi, sez. chir., 96.

From a number of experiments performed on rabbits Oliva finds that repeated chloroforming causes anaphylactic phenomena in animals, which are characterized by marked leucocytosis and are in accord with the toxic effects exerted on the liver by chloroform. Repeated etherization, however, does not cause any anaphylactic phenomena. This is due to the fact that ether exerts either no toxic action or only a slight action on the hepatic cells and other tissues, and once more confirms what has been already fully demonstrated both experimentally and clinically.

W. A. BRENNAN.

**Riche, V.:** General Spinal Anæsthesia with Novocaine by the Lumbar Route (La rachianesthésie générale à la novocaïne par la voie lombaire). *Presse méd.*, Par., 1919, xxvii, 225.

Although the author has used spinal anæsthesia in more than 1,000 cases since 1914, the anæsthesia was extended so as to become general in only about



60 cases. This is owing to the fact that it was not until recently that he became definitely convinced of the value of this method of inducing general anæsthesia.

The anæsthetic used is an 8 per cent solution of syncaïne. The patient is placed in lateral decubitus and the second, or better, the first lumbar space is punctured with the needle. A quantity of cerebro-spinal fluid, varying from 10 to 25 cc. according to the tension, is then allowed to flow out and the syncaïne solution very slowly injected at the rate of 1 centigram per minute. The quantity injected varies according to the patient's weight. For a patient weighing 60 kilos, 12 centigrams are injected, and for a patient weighing 80 kilos, the quantity used is 16 centigrams.

To facilitate the diffusion of the solution in the spinal fluid it is well to aspirate the latter several times. This is an important detail.

In almost all cases when these conditions were fulfilled general anæsthesia was obtained. Its duration varied from half an hour to one and one-half hours. The surgical procedures carried out included operations on the head, neck, thorax, and upper limbs.

In only 4 cases was there a condition of semi-narcosis. In 3 cases there was slight respiratory trouble. More frequently efforts at vomiting occurred from twenty to thirty minutes after the injections. In some instances the pulse fell as low as 60. In the majority of cases there was nothing abnormal beyond a slight rachialgia which disappeared about the second or third day. In about 10 per cent of the cases there was headache.

The method outlined offers greater security than those of Jonnesco and Le Filiatre. Its characteristics are: (1) the determination of the size of the injected dose on the basis of the body weight (1 centigram per 5 kilos of weight); (2) lumbar puncture in the second or first space with the withdrawal of 10 to 15 cc. of spinal fluid; (3) the very slow injection of 8 per cent solution of syncaïne.

When in the surgery of the head, neck, thorax, and upper limbs local anæsthesia is not applicable, this method appears to be equal to general anæsthesia by inhalation and to regional anæsthesia by infiltration.

W. A. BRENNAN.

**Desplas, B.: Five Hundred and One Cases of Regional Stovaine Anæsthesia in War Surgery** (Note sur 501 cas d'anesthésie régionale à la stovaine pour chirurgie de guerre). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 345.

Desplas uses a 1:200 stovaine solution for regional anæsthesia and a 1:50 solution with the addition of a drop of adrenalin solution to induce spinal anæsthesia.

The quantity injected may be large without causing inconvenience, 200 cc. of the 1:200 solution and 40 cc. of the 1:50 solution having been injected without causing any undue reaction.

Regional anæsthesia is generally employed for

operations above the diaphragm. For all subdiaphragmatic operations Desplas prefers spinal anæsthesia.

The operations carried out under regional anæsthesia comprised 60 cranial, 45 facial, 27 cervical, 59 thoracic, 7 spinal, 40 lower limb, and 262 upper limb operations. Blocking of the operative field is obtained in different ways which are more or less complex according to the region. In many of these important operations local anæsthesia would not have sufficed but regional anæsthesia always rendered the operation painless.

An animated discussion followed this report. Pauchet, while admitting that as regards major surgery local and regional anæsthesia have many defects, stated that they have also unquestionable advantages and have transformed the technique and prognosis in certain operations on the head, neck, thorax and abdomen. Some of these operations have been simplified while in others the resulting shock has been decreased.

Delbet protested against Pauchet's views. Although thyroidectomies have been referred to as examples of operations which have benefited by regional anæsthesia, Delbet has always performed them under chloroform without accident and fails to see in what way the anæsthesia could be improved.

Sebilea, Broca, and Duval agreed more or less with Delbet, especially as regards the operations for goiter.

W. A. BRENNAN.

**Strobell, C. W.: Scopolamine-Morphine in War Surgery.** *Med. Rec.*, 1919, cxv, 687.

The use of scopolamine-morphine preparatory to emergency surgery to be done at the dressing station is of value primarily in inducing analgesia and secondarily in anæsthetizing the wounded man en route.

A first full dose (scopolamine hydrobromide, gr.  $\frac{1}{10}$  and morphine hydrobromide, gr.  $\frac{1}{4}$ ) should be administered at once. Thirty minutes later a second similar dose should be prescribed. A third injection of a solution made from a one-half strength tablet should be given at the end of an hour. Fifteen minutes later the operation may be begun. If the operation is severe, a breath or two of ether may be administered in addition. The ears should be stopped with cotton saturated with zinc oxide ointment and the eyes covered until the surgical stage is reached. On awakening the patient does not suffer from nausea. The use of this anæsthetic results in a saving of 75 per cent in expense, 50 per cent in the number of nurse attendants, and 90 per cent in oxygen gas.

Three forms are available, the hypodermic tablet, the standard solution, and ampules.

Wiping the bend of the elbow with iodine-alcohol solution, injecting the solution into the most prominent vein, withdrawing the needle quickly, and wiping the spot with iodine-alcohol is the necessary technique.

F. P. HAMMOND.



## SURGERY OF THE HEAD AND NECK

## HEAD

**Rawling, L. B.: War Headache and Its Surgical Treatment.** *Brit. M. J.*, 1919, i, 476.

While in India, the author encountered many cases of severe persistent headache due to malaria and heatstroke. The pathologic condition found was a cerebral oedema for which he performed a decompression. The results were usually immediate and uniformly good.

Since returning to London he has observed hundreds of cases of head injuries presenting various degrees of war headache.

The following remarks apply solely to the more chronic cases of headache in which the head wounds have been healed for many months or years.

All cases of war headache here considered were secondary to gunshot wounds, concussion, etc. Out of the maze of injuries certain facts appear:

1. The more severe headaches are associated with an intact skull (closed box) or with small defects. In cases of large defects, headaches were less frequent.

2. Frontal and temporal injuries are more commonly accompanied by headache than injuries in the parietal, occipital, and cerebellar regions.

3. Wounds near the vertex in relation to the superior longitudinal sinus are frequently associated with a severe type of headache.

4. The presence of foreign bodies within the skull is commonly accompanied by chronic headache, more especially when the foreign body is situated in relation to the ventricles of the brain.

The headache usually dates from the moment of recovery from unconsciousness.

Its severity varies greatly. The most common type is cyclic—two or three days of comparative freedom followed without warning by an attack which is severe even at its inception and culminates within a few hours with more or less prostration. Within twenty-four hours the prostration terminates, leaving the patient with a sense of oppression.

The headaches tend to become localized in the frontal region irrespective of the site of injury.

The time of onset is usually in the morning on awakening or in the evening. Mental and bodily exertion also tend to bring on an attack.

Whereas the headache may exist alone, the following symptoms are often associated: slow pulse with little rise in blood pressure, temperature 99–100, insomnia, slow cerebration, exaggeration of all reflexes, slight blurring of the discs, and generalized and epileptiform fits.

The cause of the headache, in the author's opinion, is an increase of intracranial pressure due to excess cerebrospinal fluid with cerebral oedema.

The treatment consists first of a probationary

period of at least three months of absolute rest in bed and diet. The results, however, are often disappointing as soon as the patient gets up out of bed. Lumbar puncture has been carried out frequently, but has not always shown the presence of cerebral oedema. Sometimes when a considerable excess of fluid was present a perfectly dry cortex was found, while in other cases a little fluid was associated with a high degree of cerebral oedema. For relieving headache lumbar puncture is therefore also unreliable.

When there is no improvement after the period of rest the author recommends that a subtemporal decompression be done.

Within twenty-four to forty-eight hours after the operation it is customary to find that the headache, however many months or years it may have existed, has completely disappeared or else is so mild as to be negligible. During the next three weeks of convalescence there may be mild recurrences. The late results are also good and relapses have been rare.

V. P. DIEDERICH.

**Eagleton, W. P.: An Original Device for the Control of Hæmorrhage from the Large Sinuses of the Brain.** *J. Med. Soc. N. Jersey*, 1919, xvi, 116.

In the first part of the article the author discusses the surgical anatomy of the lateral sinus, calling attention to the fact that its volume of blood is large and under low pressure. This low or negative pressure makes it possible to control hæmorrhage following injury to the sinus wall by closing the gap, the lumen of the sinus remaining permeable. The gloved finger, a small piece of cotton, or a piece of fascia lata placed over the vent—the latter called the "postage-stamp method" because the fascia adheres to the injured sinus—controls the hæmorrhage without stopping the blood within its lumen.

To control hæmorrhage by invulsion of the outer wall of the sinus by compression requires considerable force because of its large volume of blood and triangular shape. While the disturbance to the return circulation by obliteration of the lateral sinus is very slight, the mechanical difficulties in ligating are so great that it has been done in only two recorded cases.

The appliance devised by the author for the control of sinus hæmorrhages holds the two ends of the suture apart so as not to compress the fixed dural attachments, while the descent of a metal obturator causes an invulsion of the outer wall of the sinus into its cavity and obliterates the sinus lumen.

The suture is applied in the following manner: A small opening is made in the dura on each side of the sinus with a triangular dural knife or cystotome. With a full-curved and blunt-pointed needle a ligature is then passed from one dural opening to the other, damage to the cerebral tissue being avoided



by keeping close to the dural surface. One end of the ligature is knotted at its center and the suture placed in the slot of the carrier and the obturator of the same side. The other end of the ligature is then placed in the opposite slots, the knotted point of the ligature being used as a fulcrum and tightened sufficiently to cause slight indentation of the sinus when the ends of the ligature are tied in a bow-knot over the cross-arm of the carrier. Tightening the upper screw of the carrier causes the descent of the obturator into the sinus and obliterates its cavity. With an artery clamp the slots of the metal arms of the obturator are then pressed firmly against the suture to hold it in position. The suture above is then loosened and removed from the slots of the carrier while the obturator is liberated from the carrier by unscrewing the lower screw. The suture may now be tied over the obturator. If the ligation is to be made above the knee it will be necessary, in addition, to perforate the tentorium cerebelli with the needle.

The upper portion having been obliterated and the downward current of blood stopped, the lower portion of the sinus is ligated. This is done more easily as the sinus walls are here much nearer. If the exposure of the bone is low enough, the lower portion of the sinus may be obliterated by pressing a tampon against its wall.

The author employed this method in a case of cerebellar abscess following a mastoid operation. The mastoid condition was the sequela of an acute otitis media following influenza. The patient made an uninterrupted recovery. G. W. HOCHREIN.

**Rezaval, E. A.: The Surgical Correction of Nasal Deformities** (Corrección quirúrgica de las deformaciones nasales). *Semana med.*, 1919, xxvi, 281.

The intranasal method introduced by Joseph of Berlin in 1902 for the removal of deformities of the nose without incising the skin is described in detail and the instrumentarium and technique illustrated and discussed as applied to the correction of (1) various types of hypertrophy of the osseous and cartilaginous tissues of the nose, and (2) the reduction of extremely large nares.

Rezaval has used Joseph's intranasal method for many of these deformities with great success and no disfiguring scar on the skin.

It is pointed out that there is a tendency on the part of the nasal tissue after a corrective operation to return to its original condition. Allowance for this tendency must therefore be made at the time of operation and when surplus tissue is removed slightly more should be cut away than appears actually necessary. W. A. BRENNAN.

**Billington, W., Parrot, A. H., and Round, H.: Bone Grafting in Gunshot Fractures of the Jaw.** *Internat. J. Orthodont. & Oral Surg.*, 1919, v, 129.

Successful treatment of gunshot fractures of the jaw means (1) osseous union, (2) good function, and (3) avoidance of disfigurement. When there

has been no loss of bone these three conditions are dependent on mechanical and aseptic technique alone, but when more than  $\frac{1}{2}$  in. of bone is lost a bone graft must be used.

After much experimenting and many failures the following technique was adopted when bone grafting was necessary, and in the past two years the graft has rarely failed to heal firmly. Osseous union is essential to good mastication and must be attained even at the expense of cosmetic results.

The preliminary treatment consists (1) in removing under anæsthesia all foreign bodies and small unattached fragments of bone and bringing together the soft parts, leaving sufficient drainage; (2) retention of as good a position as possible by dental splints; and (3) plastics on the mouth when dribbling persists. There must be complete healing of all soft parts and complete cessation of all dribbling before any operative procedure can be begun.

For the operation an efficient anæsthetic is essential. An incision is made in the lower angle of the jaw, beginning at a point 1 in. behind the end of the posterior fragment and extending to a point 1 in. in front of the anterior fragment. Considerable scar tissue will be found where the bone is lost and in cutting through this care should be taken not to open up into the mouth, an accident which necessitates postponing the operation. The fibrous tissue filling the gap and also that on the ends of the fragments should be cut away and the outer aspect of the end of each fragment beveled for a distance of 1 in. All bleeding should be stopped. The graft is next taken from the crest of the ilium on the same side as the jaw injury so that the patient can lie comfortably on the opposite side. The incision extends from the anterior superior spine as far back as is required, and a graft 2 in. longer than the gap to be filled is removed after first separating the muscles on each side of the crest. These detached muscles are then sewed together and the wound closed. The ends of the graft are beveled so as to overlap the fragment ends by about 1 in. No attempt is made to fix the graft by screws or ivory pegs, and dental fixation splints are not used until the skin wound is thoroughly healed. The graft is fixed in place by sewing the soft tissues firmly over it with hardened catgut. All dead space is obliterated and the skin accurately approximated with interrupted sutures. No drainage is used. The case is treated as a simple fracture and dentures are fitted after four to six months. P. W. SWEET.

## NECK

**Bevan, A. D.: Carcinoma of the Larynx.** *Surg. Clin. Chicago*, 1919, iii, 363.

A man, 72 years of age, upon whom the author performed a thyrotomy and removed a small carcinoma of the larynx with the cautery knife eight months previously, returned with recurrence.

Under local anæsthesia induced by  $\frac{1}{2}$  per cent apothesine, a T-shaped incision was made from above the hyoid bone down to the sternum. After



separating the muscles from the larynx and dividing the isthmus of the thyroid gland, the trachea was divided transversely just below the larynx and sewed into the lower angle of the wound. The larynx was then separated from the œsophagus behind and lifted out with the epiglottis. One point where the œsophagus has been opened in order to free the larynx was sutured and the wound closed with gauze drainage. For the first ten to fourteen days the patient was fed through a tube passed into the œsophagus to prevent leakage of food through the œsophageal wound.

In the author's opinion laryngectomy offers the best hope of permanent cure in carcinoma of the larynx, and thyrotomy is justified only in cases of small carcinomata which are discovered early.

I. E. BISHKOW.

**Hopkins, F. E.: Œsophageal Obstruction Due to Accessory Thyroid.** *Ann. Otol., Rhinol., & Laryngol.*, 1919, xxvii, 1258.

The patient, a woman 40 years of age, complained that she was not able to swallow solids. The ob-

struction was so marked and its location so definite that she thought she must have swallowed a bone. Her general health was good save for such loss of weight and strength as followed the inability to take sufficient food. There was no enlargement of the thyroid or any symptom to direct attention to this gland.

On examination no foreign body was discovered with the œsophagoscope, but about 5 inches below the level of the cricoid cartilage a soft, irregular, vascular growth projected into the lumen of the œsophagus from its posterior and left side.

The pathological examination of a portion which was removed showed it to be thyroid tissue. The vascularity of the growth was such that the removal of the specimen for examination was followed by sufficient contraction to permit comfortable swallowing. The patient has recently reported herself so well that further treatment is declined for the present.

Appended to the case report is a brief summary of references to accessory thyroids found in the literature.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Laboratory of Surgical Research, Central Medical Department Laboratory, American Expeditionary Forces, A. P. O., No. 721, France: Report.** *Boston M. & S. J.*, 1919, clxxx, 405.

The problems in the surgical treatment of thoracic injuries consist of the repair of the chest wall, the limitation of the pleurisy, and the administration of the anæsthetic. Operations performed upon dogs in ether or nitrous oxide narcosis, preceded and followed by morphine, proved successful.

Rib resection permits thoracotomy with, least damage. The ribs above and below the incision must be brought close together by means of a heavy silver or aluminum bronze alloy wire. The muscles and fascia should be closed by interrupted stitches layer by layer.

All foreign bodies, including blood, are irritants and must be removed. Flushing the pleura with solutions such as saline and Dakin's solution gives greater cleanliness but reduces the resistance. The healing reactions of pleural and peritoneal serosa are much the same but the pleural has less resistance. Resistance to infection is proportionate to the extent of the visceral serosa and the richness of the blood supply. The former is greater in the peritoneum while the latter is about the same in both the peritoneal and pleural cavities. The powers of absorption seem less in the pleural cavity.

Elimination of irritation, physiological rest, and increasing the blood supply are effective in promoting intrapleural resistance. In order to establish these conditions, the following precautions

must be observed: reduction of mechanical trauma to reduce irritation; protection of the serosa against exposure and drying; preservation of the elasticity of the lining; accurate pleural approximation; the establishment and maintenance of normal negative intrapleural pressure; and the restriction of respiratory function during the first few days.

The lung parenchyma must be resected or deeply incised. Ligation of the bronchial artery causes atrophy of the part supplied, while ligation of the pulmonary artery is followed by necrosis. Parenchymatous surfaces must be approximated and all branches of the bronchial artery and pulmonary vessels ligated. Inflation of the lung brings the operative field nearer the surface and controls the escape of air and hæmorrhage. Immobilization may be obtained by the use of a surgical bandage, by pressure, or by nerve block.

In the operations reported the pre-operative morphine was followed by pure oxygen under no tension. The pressure was then gradually increased and nitrous oxide administered. After the parietal pleura was closed, the quantity of nitrous oxide was gradually reduced. Oxygen under pressure was then given until the patient became conscious. One hundred per cent of chest wounds demand surgical treatment but not necessarily thoracotomy.

Skin incisions should not be made completely until the deeper injuries are determined. When this has been done, simple straight incisions and muscle splitting methods are most satisfactory. Spinal injuries in which the cord is intact should be treated as compound fractures. When the cord is not intact only the sucking wounds should be operated upon.



Liver injuries introduce bile into the pleura which is very dangerous, but drainage can be effected very safely.

Physical and fluoroscopic examinations determine the urgency of operation. The treatment for the cases of hæmorrhage should include hæmostasis, guarding against secondary hæmorrhage, blood transfusion, and if possible, repair. Sucking wounds should be treated as chest injuries with closure of the parietal defect; otherwise, with closure following primary drainage. Closure of the defect of pneumothorax is necessary.

The first forty-eight hours following thoracotomy performed under positive pressure anaesthesia contrast favorably with the corresponding period following operations performed under open ether. Morphine is a requisite in the postoperative treatment of chest wounds. The return of the maximum degree of pulmonary function is important though exercises should not begin until patient is afebrile. In some instances pneumonia, contralateral collapse, and empyema occurred following operation. The latter, which was often followed by adhesions, was more frequent among patients who were operated upon more than twenty-four hours after injury. Primary suture gave better results than secondary suture, due to the possibility of immobilization.

The mortality following operation was 29.6 per cent. Sixty-three per cent of the patients were too weak for operation.

F. P. HAMMOND.

**Elliott, T. R.: Discussion on Gunshot Wounds of the Chest.** *Brit. M. J.*, 1919, i, 442.

The immediate anatomic results of a perforating chest wound are familiar, but the associated physiologic and pathologic changes are not fully comprehended and we are in need of the observations of medical men who have collected data at the front to throw light upon them.

First, with regard to the reaction of the lung itself, the lung tissue may be infiltrated with blood for some distance around the wound track, but being very elastic it rarely shows contrecoup injury. The changes in the pulmonary circulation are probably those associated mechanically with hæmothorax, for the lung vessels lack a powerful vasomotor innervation. The bronchial airway, however, is enveloped by a complete muscular coat down to the openings of the bronchioles on the infundibula. While in experiments on laboratory animals it has been observed that this muscle coat can be directly relaxed or constricted by nervous impulses, what happens in man is not definitely known, although there is reason to suppose that the bronchial musculature, which grips tightest on the airway at the narrow inlet to the air sacs, has for its main purpose the protection of the elastic tissue of the air sacs from harmful over-distention. Assuming that this musculature is thrown into strong contraction throughout the lungs as the usual reaction to a chest wound, cyanosis and dyspnoea would result.

This is generally observed, and with rest and morphine these symptoms disappear within a few hours and the wounded man is able to stand an operation well.

In a certain class of cases cyanosis and dyspnoea persist, and in addition there is an inspiratory retraction of the lower intercostal spaces on the sound side, evidently a condition affecting both lungs. It is fair to assume that this state is caused, not by any local reflexes or a moderate hæmothorax, but by a prolonged reflex constriction of the bronchial musculature which renders the lung virtually inelastic and causes the intercostal spaces to be sucked in during inspiration.

As to the effects upon the lungs of the respiratory movements after a chest wound, the intercostal muscles on the injured side have an increased tone and are nearly immovable, and the diaphragm is in a position of extreme relaxation as shown by the X-ray. This reflex cessation of inspiratory activity has the same effect as constriction of the bronchiole muscles, i. e., it lessens the air current.

In hæmothorax as distinguished from ordinary pleural effusion, the elevation of the diaphragm, the small size of the chest, and the tendency to partial or complete collapse of the lung in any area, are characteristic. Recognizing this Bradford recently explained the condition as being due to an external compression caused by retraction of the chest wall and the immobility of the diaphragm in extreme expiration. The thoracic muscles assume an immobility and rigidity independent of the lung which becomes decreased in size, possibly because of an associated constriction of the bronchiole muscle which cuts off the diminished air current from the alveoli. The decrease in the air current is due to the diminished expiratory activity of the external muscles of respiration. These conditions being established, the nitrogen and oxygen in the air sacs are rapidly absorbed and large areas of lung may be deflated. General collapse is rare, although collapse may occur in small areas and may be confused clinically with pulmonary oedema or congestion. The most common site is a triangular area occupying the middle sector of the lower lobe with its base against the diaphragm. In this case the collapse is due to pressure of a distended pulmonary vein against the bronchus supplying that sector.

Following hæmothorax, clotting rapidly occurs, but coagulation is interfered with by respiratory movements so that the fibrin is partly whipped out of the blood, leaving a non-coagulable fluid full of corpuscles which may be withdrawn by aspiration. The clot remains, becomes organized, and interferes with lung expansion, resulting later in chest deformity. This can be obviated in sterile cases of limited hæmothorax by aspiration on the second or third day after injury. In cases of extensive hæmothorax, in which a large clot is known to be present, early thoracotomy with evacuation of the blood is indicated.



The real problem of chest wounds in this war, however, is the prevention and control of sepsis which was the cause of half the deaths from chest wounds at the casualty clearing stations and practically of all deaths on the lines of communication. The solution has been reached by the early complete debridement of all chest wounds due to high explosives. The closure of the wound track in the lung tissue itself prevents the escape of retained infective material into the hæmothorax cavity.

E. M. MILLER.

**Gask, G. E.:** *Surgical Aspect. Brit. M. J.*, 1919, i, 445.

The great lesson learned in this war is a clear conception of the biology and evolution of a wound. We have found that nearly 100 per cent of all wounds are contaminated and that there is an interval of some hours after the injury before infection starts during which period complete debridement should be done and the wound closed. The expectant treatment of chest wounds in the early years of the war was based, first, on the experience gained from the South African war in which most wounds were due to rifle bullets and the soil was not contaminated; second, on the fear of opening the chest without a positive pressure apparatus; and third, on the belief that manipulation of the lung might cause fatal bleeding. Under this treatment the mortality of chest wounds was high, and the fatal cases fell into three main groups: (1) those in which death occurred shortly after injury from extensive loss of blood and shock; (2) those in which the patients died several days later, from sepsis of the pleural cavity; and (3) those in which death occurred at the base, usually from sepsis.

The channels of infection of the pleural cavity are: (1) from the exterior, by missile, clothing, or splinters of rib; (2) through the wound of the chest wall when open to the air; and (3) from the wound of the lung in which foreign material is retained.

Chest wounds are classified as follows: (1) perforating through-and-through bullet wounds; (2) perforating through-and-through shell wounds; (3) penetrating wounds with retention of a large missile; (4) penetrating wounds with retention of a small missile; (5) open thorax; (6) tangential parietal wounds; and (7) thoracic wounds complicated by injury of the abdomen or spine or multiple wounds.

Rifle bullets do much less harm than shell fragments and the wounds usually heal without treatment. In shell wounds the picture is different. The fragments have an explosive effect, scattering pieces of clothing, splinters of bone, etc., in all directions and forming, as a rule, a large, ragged wound of exit. The lining of a through-and-through wound is rough and surrounded by an extensive infiltrated area. Surgical emphysema is common. Clinically after injury there is an initial distress which varies with the severity of the wound. Large sucking wounds are often fatal early unless treated by closure. Hæmoptysis is common and shock is usually present. The treatment should be:

1. Immediate rest in bed with proper measures to combat shock unless there is active hæmorrhage or the necessity for the closure of a sucking wound. Following this, a complete and careful general examination with the use of the X-ray to determine the nature of conditions within the chest and to localize foreign bodies.

2. Early operation in cases of: (a) ragged wounds of the soft parts; (b) compound fractures of the ribs; (c) continued bleeding from the inside or outside; (d) open thorax; (e) retention of a large foreign body; (f) pain which, though unusual, is often due to splinters of bone which scratch the lung; and (g) valve pneumothorax.

3. The operation should be performed as soon as possible after the patient recovers from shock. The type of anaesthesia is not important so long as the drug is skillfully administered. Wounds of the soft parts are excised except when small and clean. Splinters of ribs or scapula are removed. Exploration of the chest cavity may be done by enlarging the wound if it is in a suitable position or through a new thoracotomy wound made by resecting the fourth, fifth, or sixth rib in the anterior axillary line to obtain good exposure. If infection is apt to follow, drainage may be effected more easily by making a lower incision more toward the back. Free blood in the pleural cavity is removed by mopping, rolling the patient over, or scooping by the hand. Foreign bodies may be seen or palpated, and if accessible, should be removed. The lung may be drawn out of the wound and carefully examined. Injured tissue should be excised, or, if along a track, removed by a "pull-through." The wound of the lung should always be closed. The pleural cavity should be left dry and clean, and the chest wall closed layer by layer. Relief is usually immediate. Accumulations of fluid are relieved by aspiration.

In cases of combined injury to the chest and the abdomen, a herniation of abdominal contents through the diaphragm may be present. In such cases it is wise to open the chest first, replace the herniated structures, close the diaphragm, and then, if there is evidence of further abdominal injury, perform a laparotomy. When there are multiple injuries involving the chest and abdomen, it is better to do the abdominal work first.

Cases of simple hæmothorax caused by rifle bullets are best treated conservatively by early aspiration until evidence of infection is noted, when a large posterior thoracotomy wound should be made to allow free drainage, flushing, and the removal of clots. After such drainage has been effected this wound may be closed or left open, depending on the circumstances.

From his own experience the author is unable to determine the relative values of operative and non-operative treatment of war wounds of the chest or the extent to which early operation should be pushed, but states that during the period of retreat of the British forces in the spring of 1918 and of their rapid advance in the summer and autumn,



the results obtained when careful surgery was impossible were markedly worse than before.

As to the practical application of the principles of war surgery to the civil surgery of chest wounds, the author makes the following suggestions:

1. Thoracotomy may be used in cases of crushed chests when there is severe laceration of the lung.

2. Possibly it may be used also in cases of intrathoracic carcinoma of the œsophagus. The value of this, however, is doubted by Dr. Willy Meyer of New York.

3. In suitable cases of pneumococcal empyema in children the pleural cavity may be opened, washed out, and closed without the use of a drainage tube.

E. M. MILLER.

**Gray, H.: Pneumonia and Empyema.** *Boston M. & S. J.*, 1919, clxxx, 422, 448.

These articles are continuations of a series dealing with cases of pneumonia and empyema treated at the base hospital at Camp Devens, Massachusetts.

In one case of pneumonia and purulent peritonitis there was pus in no other serous cavity.

The diagnosis of effusion is difficult and tapping is done in vain. Nothing smaller than a No. 14 G. B. & S. needle should be used. A low percentage of serous effusions were found at autopsy. The fluid was thin and caused the surgeons to delay operation. Serofibrinous pleurisy was present in 6 per cent of the pneumonia cases. In 12 per cent of the cases of empyema sterile fluids were obtained at first and fluids yielding positive cultures later. The average volume of fluid was 277 cc.

The rapid onset of empyema indicates that effusion must be anticipated before the crisis. One patient developed empyema on the side opposite pneumonia consolidation. No operation was performed and he is improving. In 2 cases the empyema was not preceded by consolidation. Pneumococæmia may exist without pulmonary symptoms.

In many cases which were diagnosed clinically as lobar pneumonia no evidence of pneumonia consolidation was found at autopsy but there were large amounts of pleural pus and atelectasis of the lungs. The possibility cannot be excluded, however, that the lung may have been truly solid and later resorbed. In this connection reference is made to a case of typical lobar pneumonia following measles reported by Cole in which blood cultures showed the presence of pneumococcus Type 1, and purulent fluid from the left chest contained pneumococcus Type 1 and streptococcus hæmorrhagicus. At autopsy, no areas of pneumonia were found, but there were several abscesses in the left lung and a large amount of purulent exudate in the left pleura. Of 5 cases showing lobar pneumonia and developing empyema in the series here reported, 2 showed atelectasis and pus at autopsy; 1, multiple abscesses; 1, simple pus; and 1, pneumonia with no fluid and no atelectasis.

Sixty per cent of the cases of empyema developed during the first two weeks, the mortality being 41

per cent among those which occurred in the first week, 26 per cent among those which developed in the second week, and 7 per cent among those which developed later. In the cases of empyema treated surgically the mortality was 21 per cent, while in those not operated upon it was 74 per cent. Operation consisted of incision into the pleura without costectomy.

The pneumonia was lobar and bronchial, the latter consisting of lobular and interstitial bronchopneumonia. Clinically it is often almost impossible to tell whether the condition is lobar or confluent lobular.

F. P. HAMMOND.

**Oneto, A. A.: The Advantages of Thoracentesis in Serofibrinous Pleurisy** (Consideraciones sobre las ventajas de la toracentesis en las pleurías serofibrinosas). *Semana med.*, 1919, xxvi, 290.

An evacuatory thoracentesis is a harmless operation which gives the patient much relief.

An exploratory thoracentesis aids in the diagnosis and, with the cytodagnosis, helps to determine whether the serofibrinous pleurisy is tubercular or not.

A thoracentesis ought to be done whenever two or more liters of fluid are believed to be present.

When the effusion is resorbed with difficulty, a thoracentesis ought to be performed after the third week, no matter what the quantity of fluid.

A thoracentesis carried out under rigorous technique and the extracting of the fluid as slowly as possible does not increase the multiplication of bacteria in the pulmonary parenchyma.

In prolonged effusions thoracentesis favors reabsorption of the fluid.

Pulmonary tuberculosis is not a contra-indication for the evacuation of the fluid.

Thoracentesis practised aseptically cannot transform a serofibrinous into a purulent pleurisy.

W. A. BRENNAN.

**Bérard, L., and Dunet, C.: The Treatment of the Purulent Pleurisy of Influenza by Antero-lateral Drainage** (Traitement des pleurésies purulentes grippales par le drainage antéro-latéral). *Presse méd.*, 1919, xxvii, 169.

All the articles published during the past thirty years tend toward the conclusion that early pleurotomy is the ideal treatment of purulent pleurisy. During the recent influenza epidemic, however, early pleurotomies for purulent pleurisy in the instruction camps of the United States gave disastrous results. By deferring surgical intervention as far as possible and treating for the symptoms of influenza much more satisfactory results were obtained. From the viewpoint of surgery, therefore, a differentiation should be made between a purulent pleurisy which is the principal manifestation of the affection in the clinical picture and a purulent pleurisy which is a simple secondary phenomenon of a pulmonary gripe the predominating symptoms of which are asphyxia and toxæmia.



Légendre who recently reported a number of cases of grippal purulent pleuritis which were operated upon divides them into two classes:

1. Those in which dyspnoea is slight and there is neither cyanosis nor the expectoration of blood. In these an operation generally effects a rapid recovery.

2. Those with intense dyspnoea accompanied by marked cyanosis, oliguria, and disturbances of circulation. The pleural effusion is usually not extensive. In spite of operation, death usually occurs in from twenty-four to forty-eight hours.

In 26 purulent grippal pleuritis recently operated upon by the author the findings were identical with the foregoing. The deaths in this series were those of patients with severe lung lesions, usually bilateral, with intense dyspnoea, marked cyanosis, oliguria, and cardiac deficiency. The other patients, who were operated upon when the lung complications were in the course of retrogression, recovered. While it cannot be concluded that in the first type the intervention was the cause of death, it was no doubt useless and the dyspnoea was much increased by the development of an operative pneumothorax.

In influenza, therefore, it is a matter of judging the whole clinical picture and clearly distinguishing between "pulmonary" patients with the secondary phenomena of a purulent pleuritis and "pleuritic" patients with pulmonary lesions extinct or in the course of healing. The pulmonary patients should be submitted first to an exclusively medical treatment and not operated upon until later. Pleuritic patients, on the contrary, should be treated by pleurotomy without delay.

The authors point out that the classical pleurotomies often cause purulent pleuritis to become chronic due to the fact that the empyema is defectively drained. The lowest point of the pleura is anterior or anteriolateral, at the level of the tenth or eleventh rib at a point usually about 11 to 13 cms. from the midline. Frequently variations in the individual patient, either normal or pathologic, make it difficult to locate this point exactly from without.

Local anaesthesia is quite sufficient for the operation. A preliminary pleurotomy incision is made in the ninth intercostal space on the posterior axillary line and progressively enlarged to allow the escape of pus. If the patient's condition is precarious, further operation is deferred for some days. If not, the pleura is at once explored by the finger with a curved forceps. The costodiaphragmatic sinus is followed until a point is reached where the forceps begins to ascend. This is the lowest point and it is here that the drainage incision is made, i.e., a new pleurotomy with the resection of 2 to 4 cms. of the tenth or eleventh rib. While generally this point is anterior or anterolateral, in a pathologic pleura the variations are more marked than in the normal state.

The final stage of the operation consists in clearing the pleura and diaphragmatic sinus of false mem-

branes and the insertion of Carrel drainage tubes.

Postoperative care in these cases is as important as the operation itself. The patient should be left in absolute rest for the first twenty-four hours. Irrigation is not begun until the second day and is then repeated every three hours. Careful attention must be given to the anterior and posterior openings as re-infection frequently arises from them. Irrigation is usually required from eight to fifteen days.

Of the 26 postgrippal purulent pleuritis treated by the authors, 5 were followed by death within twenty-four to seventy-two hours. In 4 of these only a simple evacuatory pleurotomy was performed as the patient's condition did not permit further operation. Of the other 21 cases, 3 were pneumococcal, 10 were due to the pneumococcus and staphylococcus, 4 to the pneumococcus and streptococcus, and 2 to the streptococcus alone. Thirteen of these patients were treated by an operation in two stages. Three patients treated by a different technique required from sixty to seventy days to recover in spite of continuous irrigation.

An empyema of the pleural cavity treated according to the technique described and carefully supervised by the surgeon during convalescence ought to be cured within a month. The technique is fully illustrated.

W. A. BRENNAN.

## TRACHEA AND LUNGS

**Jackson, C.: Reaction After Bronchoscopy.** *Pennsylvania M. J.*, 1919, xxii, 434.

The chief causes for the reaction after bronchoscopy are: (1) rough, unskilled instrumentation; (2) septic instruments; (3) prolonged bronchoscopy, i. e., fifteen minutes for an infant under 1 year of age and thirty minutes for older children; (4) anaesthesia which interferes with bechic expulsion of infective agents and natural culture media; (5) too short an interval after a previous bronchoscopy; and (6) abrasion or even roughening of the epithelium in the presence of an already established purulent process.

All except the latter are avoidable and if special care is taken even this can be prevented except in rare instances.

The conclusions drawn are as follows:

1. A carefully, properly, and skillfully performed bronchoscopy is associated with little or no reaction in recent cases of foreign body in the bronchi if a previous bronchoscopy has not been done recently.

2. Any condition similar to surgical shock results from undue prolongation of the procedure or faulty technique.

O. M. ROTT.

**Bevan, A. D.: Abscess of the Lung.** *Surg. Clin., Chicago*, 1919, iii, 349.

Following tonsillectomy a patient developed pneumonia, lung gangrene, and finally abscess as evidenced by the expectoration of large amounts of foul smelling material, the clinical course, and the X-ray findings.



An operation was performed under local anæsthesia by 5 per cent apothesine. After cutting down to the parietal pleura, the insertion of a very fine needle revealed the presence of pus.

Cases of this kind are best operated upon in two stages in order to avoid an extensive empyema. Gauze packing is pushed into the wound to bring the parietal and visceral pleura in contact and left for four or five days to produce firm adhesions. A needle is then again introduced through this adherent area, a canal made down to the abscess with an electric cautery, and a rubber-tube drain inserted. Cases of this kind sometimes drain for many months and at times even a thoracoplasty is necessary to secure permanent recovery.

I. E. BISHKOW.

### PHARYNX AND ŒSOPHAGUS

**Patterson, E. J.:** *Œsophageal Stenosis; Report of Cases. Pennsylvania M. J.*, 1919, xxii, 436.

Patterson offers the following conclusions in reference to the subject of Œsophageal stenosis:

1. Caustic alkalies such as lye, cleansing powders, washing powders, etc., sold in grocery stores should have a large poison label with antidotal

advice and a large red scare label, "Keep out of the reach of children."

2. Many cases of Œsophageal stricture are allowed to reach a stage of fatal water starvation before the danger is realized. It is possible to exist for a few weeks without food but only a few days without water.

3. Gastrostomy is a relatively minor operation and should be done before the patient reaches the danger point in either food or water starvation.

4. Blind bouginage is dangerous and rarely curative. The operator can not know whether the distal end of the bougie is engaged in the lumen of the stricture or in a blind pocket.

5. Rapid dilatation is apt to rupture the Œsophagus and is associated with too high a mortality to be justifiable.

6. With the Œsophagoscope, Œsophagitis and ulceration can be seen and treated locally; a filiform bougie on a steel stem can be accurately placed in the lumen of the stricture under the guidance of the eye, and with the use of increasing sizes an ultimate cure can be obtained in almost every case without danger and without anæsthesia, general or local.

O. M. RORT.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Franco, R.:** *Encysted Peritonitis* (Peritonites encistada de la trascavidad de los epiplones). *Rep. de med. y cirug.*, 1919, x, 284.

The patient was a woman aged 23 years who came to the hospital with symptoms which pointed to a hepatic affection, probably a hepatic abscess. She was operated upon without delay. The liver, gall-bladder, stomach, and intestines were found intact, but there was a fluctuating swelling in the cavity formed by the greater and lesser omentum and the posterior wall of the stomach from which a large collection of purulent fluid was evacuated. On puncturing the left pleura a quantity of pus and about a liter of fluid similar to that found in the omental cavity was drawn off. The omental swelling had pushed the stomach upward so that most of the upper abdominal area was dull on percussion.

From both the omental and pleural collections pure cultures of pneumococci were obtained.

The patient made a good recovery except for a small fistula which closed rapidly.

Franco discusses the mechanism of the formation of these encysted purulent collections in the omental cavity and their differentiation from other similar conditions.

He concludes: (1) that an encysted omental peritonitis may be a late complication of influenza; (2) that the syndrome exhibited is sufficiently characteristic to permit an accurate diagnosis

from careful analysis; (3) that the prognosis is grave and depends upon the accuracy of the diagnosis and the promptness of intervention; and (4) that the treatment must be exclusively surgical. The route across the gastrocolic omentum which gives access to the fundus of the omental cavity is preferable to any other.

W. A. BRENNAN.

**Dodge, W. T.:** *Report on Six Hundred and Thirty-Eight Herniotomies. Mil. Surgeon*, 1919, xlv, 385.

This series of 638 cases is composed of cases considered by the examining surgeons of the camp as presenting a reasonable prospect of successful results from a military standpoint from herniotomy. Men with large herniæ and weak abdominal walls, of which there were approximately 10, were refused operation.

The total number of patients was 492 and the character of the herniæ as follows: right inguinal, complete, 128, incomplete, 190; left inguinal, complete, 83, incomplete, 207; femoral, 7; umbilical, 12; ventral, 11; total, 638.

The operations performed were: Bassini, 512; Ferguson, 94; McEwen, 2; femoral, Ochsner, 2; imbricated fascia, 5; umbilical, Mayo 12; ventral, 11; total, 638.

The number of surgeons concerned in this series was large and each one decided his own technique. Under these circumstances it would be reasonable to conclude that the results in a large series would not be so favorable as in a similar series in which



the operations were performed by a single skilled and experienced surgeon.

In the majority of cases the sac was separated and ligated high up, permitted to slip up under the internal oblique, and not kocherized. The shelving edge of Poupart's ligament was attached to the conjoined tendon with No. 3 chromic catgut sutures and the cord transplanted, the external oblique being sutured with continuous chromic gut. Skin and superficial fascia were closed with interrupted silkworm-gut sutures.

In 94 cases the cord was not transplanted, this being the only distinction between the so-called Bassini and Ferguson operation.

The routine preparation for operation was the same in all cases. The abdomen was shaved and scrubbed the day before and covered with sterile gauze which was removed in the operating room. Castor oil was given two days previous to operation and under no circumstances was a laxative given the night before. After the patient was anaesthetized the abdomen was washed with benzine, dried, and painted with  $3\frac{1}{2}$  per cent tincture of iodine.

After operation the wounds were not disturbed for ten days. The patients were permitted to sit up in two weeks, and in three or four weeks were discharged to the infirmary of the development battalions. They were not returned to full duty for two months after operation.

There were 9 cases of superficial infection, all due to staphylococcus albus. In one case of recurrence coming to the attention of the service there had been no infection and the cord had not been transplanted.

Ether was the anaesthetic used except in a few cases when nitrous oxide-oxygen was employed.

During an epidemic of Type IV pneumococcus pneumonia which developed in the hernia ward with 9 cases in one day, 44 of the 48 patients in the ward gave positive throat cultures of this bacterium. A 1:10,000 quinine-bisulphate solution was used as a gargle for all and after three days the throat cultures were negative. The rule was then adopted that every patient should use the gargle for two days preceding the administration of ether. After this, there were no further cases of postoperative pneumonia.

On the question of the permanency of the cure of the hernia it is not possible to report definite results in all these cases. So far, however, there have been 2 per cent of recurrences over an average period of four and one-half months. No deaths have occurred.

The author considers the treatment of the sac as the most important matter to consider. If thoroughly separated from the tissues and ligated at the reflection of the peritoneum, the hernia is not likely to recur. Exposing the shelving edge of Poupart's ligament and securely sewing it to the conjoined tendon he considers also of vital importance.

V. P. DIEDERICH.

**Perez, A. M.: Strangulated Crural Hernia on the Left Side** (*Hernia crural izquierda estrangulada*). *Rev. de med. y cirug. práct.*, 1919, cxliii, 33.

The case reported was that of a woman aged 64 years. The abdomen was distended and there was faecal vomiting with its characteristic odor. When the abdomen was opened a loop of small intestine was found in the hernial sac superficially discolored and undergoing mortification.

As the author was convinced that the loop still possessed vitality he made a small incision in it, washed it out with serum, sutured the opening, and returned the loop to the abdomen. Part of the hernial sac was excised and the radical cure of the hernia completed. The patient recovered after twenty-three days.

W. A. BRENNAN.

### GASTRO-INTESTINAL TRACT

**Perman, E.: The Innervation of the Stomach and Ulcer of the Lesser Curvature** (*Der Nervenapparat des Magens und das Geschwür der kleinen Kurvatur*). *Ark.f. Kir.*, 1919, li, 355.

Each vagus nerve sends a strong branch to the stomach, the left to the anterior wall and the right to the posterior wall. Both of these nerves run through the lesser omentum downward parallel to the lesser curvature and lie about  $\frac{1}{2}$  to 2 cms. from the wall of the stomach. Usually the branch from the left vagus can be seen directly beneath the anterior layer of the lesser omentum. Just above the antrum these main stems divide into the several smaller branches which enter the walls of the stomach. While the different branches anastomose with each other, there is no definite anastomosis with the branches of the terminal vagus to form an anterior and a posterior plexus, as has been described in the literature. In the lesser omentum the main branches from the vagus are joined by the sympathetic fibers of the coeliac plexus.

The nerve apparatus of the stomach is damaged in various ways by ulcers of the lesser curvature. Often the main branches are drawn into the sclerotic connective tissue surrounding the ulcer. In some instances the nerves may be entirely severed by the ulceration. Frequently perineuritis is present. Occasionally inflammatory and gross degeneration of the nerves may occur but this is more rare than perineuritis.

Many nerve fibers lying within the infiltrated area do not show any changes although they are exposed to the chemotoxic products which are absorbed from the gastric contents through the ulcer area.

Because of the fact that the nerves to the peripheral part of the stomach pass the lesser curvature, the damaging effect upon them is not purely local. The entire area supplied by the nerve is endangered. The nearer the ulcer is situated to the cardia, the greater the area of the stomach which may suffer.

The author bases these conclusions on a series of 17 cases of ulcer of the lesser curvature which he had an opportunity to study.

L. A. JUHNKE.



**Tarr, E. M.: Diagnosis of Congenital Hypertrophic Pyloric Stenosis and Pylorospasm.** *Arch. Pediat.*, 1919, xxxvi, 154.

In the diagnosis of these two conditions the greatest aid is a carefully taken case history. Practically all cases of pyloric stenosis occur in infants under two months of age. The condition is as common among breast-fed as among artificially fed babies.

The details of the history which aid in the diagnosis are the age of the patient, the temperament of its parents, the nature of the feeding, the time when vomiting first appeared, whether the vomiting is collective or projectile, the relation of the vomiting to the time of feeding, the character and size of the stools, and the loss in weight. I. E. BISHKOW.

**Balfour, D. C.: Polyposis of the Stomach.** *Surg., Gynec. & Obst.*, 1919, xxviii, 465.

The writer reports the only case of the rare benign tumors of the stomach, gastric polyposis, which has been found in approximately 60,000 abdominal sections at the Mayo Clinic. The findings of the case history are briefly as follows:

The patient, a man aged 31, had suffered from periodic anorexia for eight years. During the last three years, cramp-like pain, which began in the right and the left hypogastrium, radiated toward the midline of the epigastrium and appeared when the stomach was empty, had begun at increasingly shorter intervals after eating. There were no subjective symptoms of hyperacidity, no nausea, vomiting, or evidence of gastric bleeding. The patient had kept the pain at a minimum and his nutrition practically normal by frequent eating.

The physical examination was negative. The possibility of gastric or duodenal ulcer was excluded by the absence of free hydrochloric acid in the chemical analysis after the test meal. The pre-operative diagnosis of polyposis of the stomach was made by an X-ray examination which revealed a diffuse, mottled appearance of the entire pyloric end of the stomach. At operation a soft, doughy thickening of the wall of the normally appearing stomach was found on palpation extending from the pylorus to a line about 5 in. above. The lines of demarcation, which were quite distinct, corresponded to those of the roentgenograph. About two-fifths of the stomach was removed. Continuity was re-established by antecolic end-(gastric) to side (jejunum) anastomosis. "Immediate examination of the tumor showed a most typical example of the condition which has been described as gastric polyposis. Examination of the mucous membrane of the stump of the stomach showed that the polypoid changes did not entirely cease at the line of resection, and that small globular masses were present at various points on the mucous membrane, particularly along the summit of the rugæ, which in turn were very markedly hypertrophied. This finding created some uncertainty as to the ultimate result, but it is not unreasonable to hope that the removal of the greater portion of the diseased

tissue will have a curative effect on the isolated tumors that were not removed." The patient made a very satisfactory recovery.

Examination of the stomach showed more than 250 tumors of various sizes distributed over the entire surface of the highly congested mucous membrane, the only layer of the stomach wall which exhibited changes. The tumors were globular, about the size of a hazel nut, arranged in rows in the transverse axis of the stomach, soft and velvety to the touch, and macroscopically not suggestive of malignancy. Between the rows were a few much smaller globular elevations. Microscopic examination showed no signs of malignancy but a most tremendously hypertrophied mucous membrane.

Careful study of the case did not give any clue to the etiology of gastric polyposis. Emphasis is laid on the fact that the X-ray alone made correct pre-operative diagnosis possible. The writer concludes that polyposis of the stomach seems to have sufficiently peculiar characteristics to classify it as a separate entity which should not be confused with single polyps or with the usually malignant polypoid masses occasionally found in the stomach.

**Hartmann, H.: Cancer of the Stomach** (Le cancer de l'estomac). *Presse méd.*, 1919, xxvii, 245.

In spite of the wonderful advances in the results of the surgical treatment of cancer of the stomach since 1879 when Péan first removed a gastric cancer, there are still many physicians who are far from being convinced of the efficacy of surgical treatment for this condition. They act on the belief that surgery ought not be resorted to until medical means have failed to give the patient relief. To obtain from surgery what it can and ought give, however, an early diagnosis and a complete immediate operation are the two conditions of success.

In cases of cancer of the pylorus Hartmann makes an extensive resection of the stomach, exposes and ligates the gastroduodenal artery, separates the pylorus from the omentum, and resects a large portion of the latter for a certain distance from the stomach in order to remove with the tumor the subpyloric ganglia which are not in contact with the stomach. The retropyloric ganglia are also removed. The operation is terminated with a duodenogastric implantation or a gastro-enterostomy. Such an anastomosis is preferable to the end-to-end anastomosis of Billroth which necessitates a Y-suture of the gastric wall.

Simple gastro-enterostomy as a palliative operation is of little value when the stomach can be mobilized and resection is technically possible.

As regards the end-results, in 1906 Leriche collected 88 cases in which survival had exceeded five years after operation; in some cases it continued up to sixteen years. Although he did not remove the ganglia, Témoins found that of 169 patients who survived operation 19 had lived five to thirteen years. Mayo in 239 operations had 62 patients who surpassed the five-year limit. Hartmann has lost sight



of several of his patients but 3 have been followed for five years, 3 for six years, 2 for seven years, and 1 for thirteen years.

It is therefore permissible to say to-day that the surgical cure of cancer of the stomach is possible and great benefit would result if cases were diagnosed and operated upon at the earliest possible moment.

W. A. BRENNAN.

**Schwytzer, A.: Late Results in Stomach Surgery.**  
*Minnesota Med.*, 1919, ii, 115.

The author reviews his gastric cases for the past fourteen years. In all, there were 139 cases and 8 deaths which were distributed as follows: Carcinoma of the stomach, 26 cases with 1 death; ulcers, including strictures of the pylorus, 76 cases with 1 death; acute perforation of ulcers, 15 cases with 4 deaths; ptosis and dilatation without definite stricture, 13 cases and no deaths; and unclassified cases, mostly indistinct indications, 9 cases with 2 deaths.

In 15 cases of partial gastrectomy for carcinoma, the subsequent course was as follows: Seven far advanced cases, temporary improvement but recurrences or death within a year; one case after primary improvement could not be traced; one patient felt well for fourteen months but after twenty-two months showed signs of recurrence; one patient is well at the present time, nine months after operation; one patient felt well for three years and died after an injury but probably had recurrence; one patient living and well after three years; two patients well after three years and four months; one patient well after three years and seven months; and one patient well after thirteen and a half years.

In the 76 cases of surgical treatment for ulcer, including stricture, the operations consisted of gastro-enterostomy, pyloroplasty, excision of ulcer, and partial gastrectomy. The results obtained in the subsequent histories vary but in the large percentage of cases were very favorable.

In 8 cases of perforated ulcer with free soiling of the abdominal cavity there were 2 deaths from peritonitis. In operations for ptosis and dilatation of the stomach, the stomach was shortened by the formation of transverse folds.

In the unclassified cases the more definite the pathology found at operation the better the post-operative result.

I. E. BISHKOW.

**Richter, H. M.: Perforated Gastric and Duodenal Ulcers.** *Surg., Gynec. & Obst.*, 1919, xxviii, 399.

The author reports a series of 17 cases of perforated gastric and duodenal ulcers in which he operated. From a study of these and of 50 cases treated surgically in Cook County Hospital by various members of the staff, he concludes as follows:

1. The peritonitis resulting from a gastric or duodenal perforation is but slightly, if at all, infective during the first hours following the accident and therefore must not be treated as a suppurative process.

2. The degree of patency of the pylorus after closure of the perforation alone does not determine the indication for a gastro-enterostomy.

3. The mortality is determined in a high degree by the operator's technique, quite irrespective of the method he uses.

While the perforation permits the escape of irritating gastric contents into the peritoneal cavity, the stomach contents are rarely very actively infective even in the presence of a perforating ulcer. The reaction produced is in the nature of a chemical peritonitis and calls for mechanical emptying of the peritoneal cavity. The one thing logically to be avoided in such cases is the insertion of gauze or tubes into the peritoneum for drainage as it will surely entail the danger of infection to the already badly damaged peritoneum. The author therefore closes the peritoneum without drainage except (1) in late cases (after eighteen hours); (2) the rare instances of inadequate closure of the perforation due to physical inability adequately to invert the lesion; and (3) when gross masses of stomach contents are spilled into the peritoneum.

Gastro-enterostomy is advocated practically as a matter of routine. All ulcers at or near the pylorus are so thoroughly inverted as to require gastro-enterostomy and in all other cases the therapeutic effect of the operation is regarded as valuable. The one case of the author's series which came to autopsy showed seven active ulcers, two of which, beside the ulcer which perforated, were sloughing. Excision of the ulcer by knife or cautery is an unnecessary complication of the technique of treatment. The ulcer is grasped with through-and-through sutures and all of it extensively inverted.

That, irrespective of the type of operation followed, the technique used plays an important part, is shown by the fact that operators using widely different methods have obtained equally good results. The essential elements in good technique are an ample incision to afford easy access and the bringing of the parts into view with a minimum of disturbance and without pulling them out of their normal position. The perforation having been found, it should be sutured without spilling the gastric contents and peritonized.

**Duval, P.: A Point in the Technique of Posterior Transmesocolic Gastro-Enterostomy** (Un point de technique opératoire de la gastro-entérostomie postérieure transmésocolique). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 392.

In the ordinary submesocolic method of performing gastro-enterostomy the stomach is brought somewhat blindly through the mesocolic opening to the jejunum. In the method proposed by the author — the supra-mesocolic method — the stomach is well exposed and the small intestine is brought up through the mesocolic opening to the site of the gastric anastomosis.

Duval's method includes the turning back of the omentum toward the sternum, colo-omental ex-



posure, and the opening up of the lesser peritoneal cavity throughout its whole length. The posterior face of the stomach then comes into view as the whole pyloric vestibule is exposed. The site of the new opening is then selected. The mesocolon is split from above downward rather than from below upward, and through the opening the loop of small intestine is brought into contact with the posterior gastric wall.

W. A. BRENNAN.

**Perman, E.: Multiple Submucous Chyle Cysts of the Jejunum** (Ueber multiple submuköse Chyluszysten des Jejunums). *Ark. f. Kir.*, 1919, li, 331.

While recently there have been other reports of chyle cysts, all of them have been based upon autopsies. The case reported in this article was discovered at operation.

The patient was a married woman, 44 years of age, the mother of five healthy children. Her father had died probably of cancer of the stomach, and her mother, supposedly of gastric ulcer. During childhood the patient had been weak, but later became stronger and remained well until 1906. At that time she began to have attacks of sharp pain in the epigastrium, described as a tearing or pinching pain, which occurred shortly after eating and were accompanied by belching, vomiting, loss of appetite, and sluggish action of the bowels. At times also she had attacks of diarrhoea, dyspnoea, and headache. She became very much emaciated and throughout the duration of these symptoms was very nervous.

In 1914 because of this condition and the findings of the X-ray examination which revealed a contraction of the duodenum, an operation was decided upon. A median incision having been made above the umbilicus, a free band of adhesions was found extending from the lesser omentum diagonally over the anterior wall of the pylorus to the gastroduodenal omentum. It could not be determined whether this acted as an obstruction or not, but after ligation it was removed. From the bend at the juncture of the pars superior and pars verticalis of the duodenum were strong fibrous adhesions which ran upward and backward and seemed to draw the duodenum up. No definite infiltration was palpable. A retrocolic posterior gastrojejunostomy with exclusion of the pylorus (Wilms) was done.

Following this operation the patient was somewhat better, but the former symptoms soon returned. Subsequently her condition was diagnosed at different times as hysteria and chronic post-operative ileus and enteritis.

During a second operation, performed in 1918 by Ekehorn, a peculiar change was found 90 cms. distal to the pylorus in a loop of the jejunum measuring 55 cms. which was gray, pale, and of average thickness. Below the serosa were several filled white chyle vessels which could be followed to the mesenteric attachment, but no further. At the mesenteric attachment were several small cysts

with a clear, yellowish content. Under the serosa of the bowel were white spots. On palpation the intestinal wall was found to be much thickened. The change to normal at both ends of this diseased area was quite abrupt. The mesentery of the loop was pale, hard, and thickened, but not shortened or shriveled. Both the diseased portion of bowel and its mesentery were entirely free from adhesions, and no lymph or chyle cysts were found in any other part of the abdomen. There was no ascites and no palpable change in the pelvis or the posterior abdominal wall. The diseased loop was resected and the ends united side-to-side.

One month later the patient was much better but was still very nervous though her appetite was good, she slept well, and she was able to do a little work. Severe pain was entirely absent but occasionally she had attacks of slight pain and diarrhoea. The abdomen was still a little sensitive to palpation on both sides of the umbilicus.

The pathologic examination of the resected portion of bowel showed the presence of a very large number of cysts, irregular lymph spaces, and dilated lymph vessels with extravasation of chyle localized principally in the submucosa.

The question arises whether the changes found belong to the class described in the literature as lymphangioma or lymphangiectasis.

L. A. JUHNKE.

**Cordoba, S.: Resection of the Ileocecal Segment for Cancer, with Anastomosis of the Sigmoid to the Ileum** (Resección del segmento ileo-cecal por cáncer, con anastomosis ileo-sigmoidea). *Gac. méd. de Caracas*, 1919, xxvi, 49.

Cordoba's patient was a man aged 45 years. Exploration showing the presence of an abdominal tumor, a median infra-umbilical laparotomy was done with the patient under ether. The tumor was found implanted in the iliac fossa and occupying the ileocecal region. The lymphatics were much enlarged and strongly adherent to the walls of the fossa. The portion of intestine involved was resected. This consisted of 2 cylinders, the smaller, about 4 cms. long by 2.5 cms. broad, being the last part of the ileum, and the larger about 16 cms. long and 6 wide, being the caecal part of the large intestine. On microscopic examination the neoplasm was found to be an adenocarcinoma. After the resection an ileosigmoideal anastomosis was done, the caecal region peritonized, the iliac fossa drained, and the abdomen closed. The patient got up after twenty-two days. When seen seven months later his general condition was good and his appetite and bowel function were normal. No recurrence was apparent.

W. A. BRENNAN.

**Rohdenburg, G. L.: Benign Tumors of the Intestine; with a Report of Nine Additional Cases.** *J. Lab. & Clin. M.*, 1919, iv, 434.

Only about 130 cases of benign tumors of the intestine have been recorded. These tumors occur



more frequently in the female than the male and are most common in the rectum and colon. Often they are found only accidentally but sometimes give rise to intestinal symptoms, hæmorrhage, or intestinal obstruction due to blockade or intussusception.

The author reports 9 new cases. Three of these patients entered the hospital with a diagnosis of intestinal obstruction, 4 with intestinal hæmorrhage, 1 with appendicitis, and 1 with an abdominal sinus following appendectomy. In 3 cases of obstruction, intussusception involving the ileum was found and a portion of the bowel was resected. Two of these patients made good recoveries. In one case a mass was discovered inside the appendix, and in the other a round mass at the opening of the bowel. In one case of intestinal hæmorrhage the bleeding proved to be due to a tumor in the jejunum, and in 3 cases to a tumor in the rectum about 12 to 15 cms. from the anus. Removal of the portion involved was followed by good recovery.

Microscopic examination of the tumors showed their character to be as follows: 3 fibromata, 1 in the rectum and 2 in the ileum; 1 myoma, in the jejunum; 3 adenomata, 2 in the rectum and 1 in the ileum; and 2 lipomata, 1 in the ileum and 1 in the appendix.

F. P. HAMMOND.

**Bazy, L.: Diagnostic and Prognostic Value of Bacteriotherapy in Surgical Affections of the Abdominal Viscera and of Appendicitis in Particular** (Valeur diagnostique et pronostique de la bactériothérapie dans les infections chirurgicales des viscères abdominaux; appendicite en particulier). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 468.

Animals living on soils contaminated with certain bacteria are in a condition of anaphylaxis with regard to these organisms. A somewhat similar condition may be found in man. The carrier of bacteria in insufficient numbers to cause disease is in the same state of lessened resistance as the animals referred to, i.e., a condition of bacterial anaphylaxis. Such a condition is usual in abdominal inflammatory affections.

Bazy never operates unless the patient's resistance is increased, and in order to increase it he resorts to vaccination. To be effective the vaccination must be specific. The study of many removed appendices shows that the enterococcus, streptococcus, staphylococcus and colon bacillus are the organisms usually found in the pus, the latter being the most common. In cases of appendicitis, therefore, Bazy uses either a quadrivalent vaccine or, more generally, a vaccine composed of different strains of bacillus coli.

A normal subject or a patient who has recovered from appendicitis does not react to such vaccination but those with bacterial anaphylaxis constantly show a reaction which varies directly with the amount of their hypersensitivity. The vaccination therefore has a double value; it not only fortifies against bacterial anaphylaxis but makes the diagnosis of the condition possible.

In cases of acute appendicitis in which Bazy was not able to operate in the early stages he uses vaccination in order to avoid operating during a period of hypersensitivity.

About 1 cc. of bacillus coli vaccine containing from 80 to 100 million bacteria is injected intradermally. A healthy or recovered patient has very slight or no reaction. The redness around the puncture is considered normal if it does not exceed the size of a 5-franc piece. A patient who still has inflammation shows a marked rise in temperature and a red plaque around the site of the injection which often exceeds the size of the palm of the hand. In addition, there is frequently general malaise.

Up to the present time Bazy has been guided by this intradermal reaction in determining the time to operate and has never been deceived by it. The test may have to be repeated three or four times before a normal condition is reached, especially in cases of badly diseased appendices. It is probable that the test may be made with equally good results in cases of colon-bacillus infection other than appendicitis, but the author has used it only for lesions of the appendix.

As compared with the present more or less empirical methods of determining the time at which cases of appendicitis have ceased to be inflammatory and may be operated upon, the vaccine treatment described offers the following possibilities: (1) it determines the existence of bacterial anaphylaxis, and (2) it strengthens the organic defence against the complications which sometimes follow in the wake of surgical operations.

W. A. BRENNAN.

**Pennington, J. R.: Imperforations of the Rectum and Anus and Their Treatment.** *Illinois Med. J.*, 1919, xxxv, 176.

Malformation of the rectum occurs once in every 5,900 infants. This condition is due to one of three causes: (1) persistence of the original opening into the cloaca; (2) non- or imperfect development of the postallantoic gut; and (3) non- or imperfect development of the proctodeum.

In malformations due to the last two causes mentioned the intestine ends in a blind pouch which may be very difficult to locate. The indication, however, is to make an outlet for the feces at the normal position of the rectum. When a plastic operation is impossible, colostomy is performed.

I. E. BISHKOW.

**Farr, R. E.: Rectal Surgery under Local Anæsthesia.** *Minnesota Med.*, 1919, ii, 134.

Direct infiltration with novocaine makes possible many operations in the rectal region. After surgical preparation of the patient and the administration of a laxative the night before, pantopon in  $\frac{1}{2}$  gr. doses is given hypodermatically the morning of the operation and repeated once. A circular area of anæsthesia is thus produced about 1 inch from the anal margin. Through this anæsthetized area

deep anæsthesia is effected for a depth of 3 to 4 inches posteriorly and laterally and less deep in front. About 3 ounces of  $\frac{1}{2}$  of 1 per cent of novocaine are used. The sphincter is then dilated with the speculum. For hæmorrhoids the author uses the cautery method; for ulcers, excision and suture. Following the operation the bowels are kept quiet for three to four days at the end of which time warm oil is introduced through a rubber catheter. I. E. BISHKOW.

### LIVER, PANCREAS, AND SPLEEN

**Petridis, P.: Two Cases of Torsion and Ectopia of the Spleen** (Deux cas de torsion et d'ectopia de la rate). *Lyon chirurg.*, 1918-1919, xv, 747.

The first case was that of a man aged 40 years. The findings of the general examination suggested the presence of a tumor of tubercular nature while the examination with the patient under chloroform immediately before operation led to the diagnosis of cystic abdominal tumor. An abnormal condition of the spleen was not suspected. On opening the peritoneal cavity a tumor was found intimately adherent on its inner surface to the omentum. Further investigation revealed the fact that the spleen was enlarged and ectopic. On extending the incision upward it was then discovered that the tumor was a neoplasm of the upper pole of the spleen in which a

portion of the omentum was enclosed. A splenectomy was done.

Examination of the spleen showed that it had become twisted on its pedicle, its apparent external surface being in reality its inner surface. At the base of the pedicle was a tumor the size of a small cystic kidney. Above this were two smaller growths. These masses had been produced following three strictures of the hilum of the spleen.

The second case was that of a woman aged 32 years. The clinical diagnosis made after careful examination was hypertrophied spleen, ectopic in the right iliac fossa. On opening the peritoneal cavity the mobile spleen was found increased in size to three times normal and rather free from adhesions in its lower half and on the surface corresponding to the anterior abdominal wall. Elsewhere it was adherent to the omentum. The tail of the pancreas was involved in the ptosis into the right iliac fossa and with the appendix was incarcerated in the adhesions with the spleen and omentum. Examination of the splenic pedicle revealed a double torsion. There was also a supernumerary spleen which was attached to the spleen proper by a pedicle. The hilum was ligated, the spleen removed, and a typical appendectomy performed.

Both patients made good recoveries and healing occurred by first intention. W. A. BRENNAN.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

**Haas, S. L.: The Changes Produced in the Growing Bone After Injury to the Epiphyseal Cartilage Plate.** *J. Orthop. Surg.*, 1919, iv, 226.

This article is a continuation of previous reports on the same subject giving the results of operations performed on dogs.

On cutting through the metaphyseal region and removing the proximal portion, growth was hindered because of the direct injury to the cartilage plate and the destruction of the vascular supply coming from the nutrient artery.

Injury to the cartilage plate without destruction of the blood supply resulted in a loss of growth directly proportionate to the damage to the cartilage plate.

Simple cross incisions through the bone had no effect unless they involved the cartilage plate. Longitudinal incisions were injurious because they cut off the blood supply and produced lateral friction on the cartilage plate. Removing the epiphysis distal to the cartilage plate had no effect upon the growth.

Growth was found to be hindered in proportion to the amount of injury to the cartilage plate and its blood supply. L. C. DONNELLY.

**Munyerro, J. A. A., and Frias, J. B.: An Interesting Case of Congenital Malformation of the Four Extremities** (Un cas interesante de malformacion congenita de les cuatro extremidades). *Rev. españ. de cirurg.*, 1919, i, 73.

The case was that of a boy 6 years of age. In the right hand the central part, the third and fourth fingers, and the corresponding metacarpals were missing. In place of the central part of the hand was a deep fissure which gave the hand the appearance of a pincers. The thumb and forefinger were fused.

In the left hand the second, third, and fourth fingers were joined.

In the right foot the metatarsals were fused and there were only two toes.

The left foot was fissured like the right hand, and the second, third, and fourth metatarsals and second and third phalanges were missing.

The author finds only three cases in the literature in which all four extremities showed somewhat similar congenital deformities. The principal theory in regard to the cause of the condition is that it is hereditary, particularly from a male ancestor. In the case here reported, however, the child's father and mother were both normal and although the further family history is not quite clear, there appears to be no ancestral taint of the kind described. W. A. BRENNAN.



**Metcalf, C. R.: Impairment of Function of the Hand Due to War Injuries.** *J. Orthop. Surg.*, 1919, iv, 198.

In recent wounds of the hand in which the joints are not involved the author recommends active movement in addition to massage. By such treatment, stiffness is prevented and the necessity for manipulation later under an anæsthetic is avoided.

When in recent wounds the joints are involved and ankylosis is expected, it is essential that the hand should become fixed in the position of choice. Not every hand injury requires the application of a splint, but if a splint is necessary its use should be continued until the danger of deformity has been eliminated. When as an end-result permanent loss of supination or of pronation is expected, the forearm and hand should be fixed approximately midway between these two, erring slightly on the side of supination. All injuries in the neighborhood of the wrist-joint should be fixed with the wrist dorsiflexed. A splint which dorsiflexes the wrist should lie on the ventral side rather than on the dorsal aspect of the forearm. If permanent ankylosis of a metacarpophalangeal joint is expected, the joint should be fixed in semiflexion.

In old wounds of the hand not involving the joints vigorous manipulation under anæsthesia is futile unless the patient can be induced to continue active movement immediately after manipulation. In such cases the treatment may consist of gradual mobilization and in some instances, of tendon transplantation.

If the fingers are fixed in flexion, the author places the wrist in a position of palmar flexion, maintaining this position by counterpressure on the dorsum of the hand. Extension of the interphalangeal joints is procured first, extension of the metacarpophalangeal joints next, and finally dorsiflexion of the wrist. If the fingers are fixed in extension, the wrist is placed in dorsiflexion and maintained in this position by counterpressure on the palm of the hand. In this case flexion is obtained first in the metacarpophalangeal joints and next in the interphalangeal joints.

When in old wounds there is involvement of the joints, passive manipulation, gradual stretching, resection, dissection of tendons, and plastic operations on the tendon sheaths are usually futile. The position of the hand, however, may be changed to the position of choice. In some instances amputation may be necessary.

To diagnose nerve lesions in the forearm, the regions of atrophy, cyanosis, or undue perspiration and deformities should be observed. Then request the patient to pronate the forearm, flex the terminal phalanx of the thumb, and oppose the thumb to the palm (median nerve), abduct and adduct the little finger (ulnar nerve), and extend the wrist and the metacarpophalangeal joints (musculospiral nerve). The loss of sensation should be determined with a pin and a piece of fluffy cotton and the findings verified with faradic or galvanic stimuli. If a nerve

is wholly or partly divided or is embedded in scar tissue, operation is advisable. For complete division, unless the section of nerve destroyed is too long, and for partial division as well, the nerves are usually sutured. Good results are almost invariably obtained with the musculospiral nerve but rarely with the ulnar and median nerves.

A suitable splint for paralyzed muscles must prevent overstretching, whether from gravity or the contraction of opposing muscles, permit treatment, dressings, massage, and even harmless movement without its removal, and allow free circulation in the splinted area.

In functional paralysis the condition is a loss of the power of movement of the parts as a whole rather than of a particular muscle group. The deep reflexes are normal and always present, there is no muscle atrophy, and there is never a paralysis of definite muscles in combination with a loss of sensation in the corresponding area. In this condition the exact distribution of a sensory nerve is never found to be mapped out by anæsthesia but commonly there is complete anæsthesia below a given level. The electric reaction shows no degeneration.

L. C. DONNELLY.

**Henderson, M. S.: Derangements of the Semilunar Cartilages of the Knee-Joint.** *Minnesota Med.*, 1919, ii, 138.

The cartilage most frequently injured is the internal cartilage. The position in which such injury is most apt to occur is that assumed when the knee is partially flexed and the foot is rotated outward. In extension, the inner cartilage may be caught and crushed. Pain, disability, and effusion soon follow. Early reduction should be attempted, and if successful, a cast should be applied. In some cases there may be repeated attacks, each followed by pain, swelling, and locking of the joint. As tuberculosis is apt to develop, the leading English surgeons advise operation.

The X-ray helps merely to differentiate this condition from a loose osseous body.

In the surgical treatment the greatest care must be taken to assure thorough asepsis. Usually from three to four-fifths of the cartilage are removed. The joint is closed layer by layer with interrupted sutures of plain catgut and the skin closed with silkworm and horsehair. A cast is then applied for seven days.

A report of the results obtained in a series of 98 cases is appended.

I. E. BISHKOW.

## FRACTURES AND DISLOCATIONS

**Brewer, I. W.: A Record of the Fractures Among 10,287 Men Discharged from the United States Army During November, December, and Part of January, 1918 and 1919.** *Boston M. & S. J.*, 1919, clxxx, 304.

Advantage was taken by the author of the record of fracture cases at Camp Humphreys from the



time of the signing of the armistice to Jan. 8, 1919. During this period 10,287 men were examined for demobilization and a tabulation was made of the fractures that had been sustained.

The total number of fractures was 665 (64.7 per thousand). Of these, 15.2 per cent were fractures of the humerus; 14.8 per cent, Colles' fractures; 10.9 per cent, fractures of the phalanges; 8.8 per cent, fractures of the clavicle; 8.2 per cent, fractures of the tibia; 7.7 per cent, fractures of the femur; and 6.0 per cent, Pott's fractures. In addition, there was one fracture of the malar bone, two cases of fractured pelvis, and one case of vertebral fracture.

The table gives no record of the causes of the fractures. The report of the Surgeon General in regard to the 6,469 fractures which occurred during the year 1917 gives the causes as follows: Falls, 32.6 per cent; crushing accidents, 8.5 per cent; automobile, 7.6 per cent; by animals, 5.9 per cent. While the causes here reported may vary from those in civil life, they forcibly present the importance of measures now being taken by public health boards to prevent the classes of accidents described.

V. E. DUDMAN.

**McCarty, F. B.: Fractures of the Carpal Scaphoid.**  
*Surg. Clin. Chicago*, 1919, iii, 371.

Fracture of the carpal scaphoid is a common injury infrequently diagnosed and consequently followed by permanent disability of the wrist. The economic loss resulting from more or less marked permanent impairment of the wrists of men in industrial pursuits makes essential the careful examination of the carpal bones in every injury at or about the wrist-joint. The signs of this fracture are distinct and characteristic, so that diagnosis from physical examination alone is not difficult. In an out-patient clinic, 23 cases were encountered in a period of two months, and in each instance the diagnosis was made previous to X-ray examination.

Fracture of the carpal scaphoid is essentially a fracture occurring in adult men and results from direct violence transmitted through the hand, rarely by a blow directly over the bone. There is usually a history of a fall backward with the hand and arm rigidly outstretched, so that the full force of the impact was received on the ball of the thumb, the hand being hyperextended and deviated toward the ulnar side.

The scaphoid has roughly the shape of a hollowed-out crescent with blunt ends and a constricted neck near the middle. The proximal half is almost entirely articular while the distal portion is largely fixed by ligamentous attachments. Thus, with the hand extended and deviated toward the ulnar side, the long axis of the scaphoid lies almost directly in line with the forearm, and the entire force of the blow is transmitted through it. Fracture usually occurs at the narrowest and weakest part, which is the middle of the arch, and may be clean-cut or comminuted and compacted, the former being the rule.

The symptoms of simple scaphoid fracture are, in general, those of sprain of the wrist without accompanying physical signs of sprain. The pain is of moderate severity but very persistent, especially when the hand is in hyperextension and adduction. Sharp pain is also elicited on pressure directly upward against the ball of the thumb. Tenderness is definitely limited to the region of the bone itself.

The limitation of motion is characteristic, hyperextension and lateral motion being limited. The swelling in a fracture of this kind is limited entirely to the dorsolateral surface of the wrist.

Old untreated or improperly treated cases of fracture show persistence of all of the signs of fresh fracture, less marked but still demonstrable. This is due to the fact that such cases rarely obtain bony or adequate fibrous union, and the upper fragment persists as an entirely articular body, loosely attached and subject to unusual mobility when extremes of motion or force are attempted.

In the diagnosis there are four lesions which must be differentiated: (1) injury to the soft parts — sprain; (2) injury to bone above the radiocarpal joint; (3) injury to other carpal bones; and (4) separation of centers of ossification in a normally ununited scaphoid.

To be effective the treatment must be applied within a few days of the injury. In the simple fracture, fixation of the wrist is all that is necessary. Severe comminution may require open operation. Even in severe cases, however, an attempt at reduction should be made first without incision. Moderate impaction is a highly desirable condition. When the fragments of the scaphoid are dislocated, the method used is, first, the extension and adduction of the hand; second, backward pressure with the thumb over the fragment; third, abduction of the hand; and fourth, flexion of the hand. Arthritis is a common and distressing complication.

P. H. KREUSCHER.

**Boppe: A Series of 103 Thigh Fractures** (A propos d'une série de 103 observations de fractures de cuisse). *Rev. de chir.*, Par., 1918, lv, 35.

Of the 103 war thigh-fracture cases which Boppe reports as treated in a special fracture service, 30 were fractures of the lower third of the thigh (7, supra- and intercondylar; 32, subcondylar); 37, of the middle third; 18, subtrochanteric; 7, fractures of the mass of the trochanter; and 2, fractures of the neck of the femur. They came to the author's service either directly from the firing line or the first-aid station or through a clearing station at the front after preliminary operation.

Generally the patients were in good condition. Of 89 cases of open thigh-fractures, 8 reached the author's service directly from the front, 8 patients had received some minor treatment, and 73 had been operated upon for surgical clearance and disinfection.

Most of the patients were evacuated immediately in Thomas splints. In 8 of the 89 cases of open



fractures no further operation was performed. The results were 5 recoveries, 3 failures, and 1 subsequent resection of the hip. In these instances the patients had not been operated upon extensively at the front. Other procedures and results in the cases reported were as follows:

In 6 cases in which secondary suture was performed there were 5 successes and 1 failure. Of 14 patients whose wounds were not re-opened, 9 were evacuated cured and 5 with fistula. In 17 cases in which a secondary clearance operation was necessary, good results were obtained in 15, while in 2, secondary amputation was required. Six hip-resection cases gave 5 successes and 1 failure. Of 4 patients upon whom resections of the knee were performed, 1 died from late tetanus, and 1 from secondary hæmorrhage. Thirty-two patients were afebrile when discharged and in excellent condition, but have not been followed sufficiently long to warrant a definite conclusion as to the final outcome.

During the period of six weeks in which the 103 patients were under observation the mortality was 7 per cent. Two of the deaths were immediate, and 5, secondary.

In the author's opinion, fractures of the thigh should be operated upon at the front and as soon as possible. The patients should then be evacuated to a special hospital for further treatment. In support of this conclusion he compares the results of primary operations at the front in the present series with those of similar cases which were dispatched from the front to a rear hospital about the same distance away. In the first series the patients usually arrived in good condition, while in the second many of the men on arrival were hæmorrhagic and shocked or had beginning gas gangrene and in spite of every effort a considerable number of immediate deaths occurred.

In the series of 103 cases under consideration the primary operation at the front had been done during a period of intense fighting. The author therefore believes that the great majority of such fractures are not untransportable and that if the thigh is well operated upon, well immobilized, and well dressed, the patients can undertake a journey without any danger within a few days following the primary operation.

In the author's opinion re-operation should not be a routine procedure, but should depend upon the clinical course of the wound. Of 14 patients not re-operated upon, 9 left the hospital one month later without fistula and with wounds almost healed.

As the best apparatus for immobilization, the author recommends the Thomas splint. Delbet's thigh-fracture apparatus, which is best during treatment, has the following advantages: (1) it permits or rather demands walking; (2) it is well supported and scarring is exceptional; (3) the functional results obtained by its use are uniformly good and the average amount of shortening is only about 1 cm.; (4) it permits good anatomical reduction; (5) as walking is possible, it favors consolida-

tion; and (6) it can be fixed in position rapidly and allows easy access to the wound.

Boppe does not favor the use of suspension apparatus which he believes have very limited application in fractures of the thigh.

W. A. BRENNAN.

### SURGERY OF THE BONES, JOINTS, ETC.

**LeConte, R. G.:** *New Methods in Amputations and Prosthesis of the Lower Limbs.* *U. S. Nav. M. Bull.*, 1919, xiii, 244.

In order to obtain the best ultimate results for mutilated men, close collaboration is needed between the surgeon, the orthopedist, the manufacturer, and the technician. The research work would be advantageously centralized in one institution for the proper co-ordination of the efforts of these experts.

A highly successful system of treatment for men upon whom amputations have been performed was devised by Martin of LaPanne, Belgium, and described by him in a recent contribution to prosthesis. This system provides for the substitution of an exact artificial counterpart of the missing member in addition to appropriate treatment of the stump for the maintenance of muscular development and joint control.

When amputation is inevitable, the modern surgeon's attitude in the treatment is governed by the following considerations: first, the saving of life; second, the preservation of all tissue that will aid in actuating the artificial limb, and third, the healing of the wound in the shortest possible time (two to four weeks) so as to preserve the function of the joint above and the muscles controlling it. A carefully molded and adjusted provisional apparatus permitting the patient to walk immediately on both legs and thereby guarding against the loss of static equilibrium is then fitted without further delay by the orthopedist and for the following reasons represents an indispensable element in the treatment: It permits immediate walking, replaces the mechanical or manual mobilization of the stump and massage of the muscles by natural and agreeable exercise, exerts a profound influence on the mental attitude of the patient toward his mutilation, improves the general health, permits early re-education in walking, and exerts on the stump the necessary and beneficial action of supporting weight which hastens its shrinkage and thereby shortens the period for the fitting of the artificial limb. The construction of an inexpensive and highly serviceable temporary apparatus is described in LeConte's article the purpose of which is only to call attention to the monumental and epoch-making studies of Martin.

When the stump has become sufficiently permanent, it is time for the adjustment of the artificial leg which must copy exactly the lines and measurements of the lost leg in order to reproduce its functions. In contradistinction to ordinary artificial limbs, an anatomically correct apparatus for a mid-thigh amputation stands erect and as firmly on the ground as



a riding boot with its tree. The Belgian artificial leg is the only one that reproduces the natural static qualities of the lower limb and in accomplishing this it reproduces the esthetic qualities also. It is waterproof and therefore easily cleaned. It can be made without seeing the patient if the proper measurements and projections are taken and accompanied by a cast of the sound limb and stump. Its mode of construction, the materials used, and the articulations are all new and founded on scientific principles derived from a study of the anatomy and physiology of the leg. The cost of the limb at LaPanne is well below that of the American-made leg. The length of life of the apparatus is at present unknown but there is every reason to believe that it will last for many years.

To Martin belongs the credit of being the first to place the rehabilitation of those who are mutilated on a sound, scientific basis. His principle is the reproduction in the artificial limb of all the curves, angles of deflection, and joint axes of the limb lost, and he models the new leg on the measurements and projections of the leg that remains, reversing the projections to produce its counterpart. The stump enters his apparatus in its normal obliquity downward and forward, and in actuating the artificial leg the muscles which control the movement of the stump will conform to their normal movements of walking.

F. ROBBINS.

**Mauclaire: Bone Grafts to Repair Losses of Diaphyseal Substance in War Wounds** (Les greffes osseuses pour réparer les pertes de substance diaphysaires dans les cas de plaies de guerre). *Presse méd.*, 1919, xxvii, 212.

Mauclaire gives a short review of bone grafting for the repair of bone defects, especially in the long bones.

A loss of diaphyseal substance not exceeding 3 cms. he calls a pseudarthrosis; the destruction of more than 3 cms. he designates as an "extensive loss of substance."

Owing to the danger of infection, a bone grafting operation should not be undertaken until at least six months after the wound has cicatrized. Mauclaire believes that the length of a graft is limited to about 15 cms. and that an autograft is best.

The great divergence of opinion among surgeons who have published results of bone-graft operations may be explained by assuming that some of these authors examined grafts which were well nourished while others reported regarding those which were badly nourished (a frequent condition) and therefore ultimately absorbed. From the viewpoint of function there is no doubt that when a graft is well nourished it really "takes," or is altered or entirely replaced by new bone.

Mauclaire describes the technique of (1) total segmental grafts, (2) partial segmental grafts, (3) grafts "en plaques" as used by Codavilla, Albee, and others, (4) central intramedullary grafts, and (5) pediculated bone grafts.

During the operation the most rigorous asepsis is necessary and the surgeon's rubber gloves must be changed several times. The graft should not be touched except with the forceps, all fibrous tissue must be carefully removed, and hæmostasis must be perfect. Trauma to the tissues must be avoided as much as possible. To obtain good consolidation the graft should be implanted in the medullary canal from above downward. In spite of all precautions, however, the bone may bleed and a hæmatoma result. After the grafting has been completed the limb should be immobilized.

The immediate results are not always satisfactory. Hæmatomata are frequent and sometimes a small fistula persists.

In a paper presented by Mauclaire to the Société de Chirurgie in Paris he collected the reports of 128 cases of segmental grafts for war wounds. These were nearly all autografts and 72 were successful. In 24 of his own cases of segmental grafts Mauclaire obtained successful results in 8. These were cases of very extensive losses of substance or other difficult conditions.

If the graft is badly nourished it undergoes osteoporosis and even fracture. A fractured graft will not consolidate. If the graft is well nourished, it thickens and may hypertrophy.

Mauclaire discusses also the other methods of repairing extensive losses in the long bones, pointing out the defects in each. While in numerous cases osteoperiosteal grafts have given very good results and are easier to execute than segmental grafts, the latter are far superior.

Mauclaire believes that bone grafting as a surgical method is only in its infancy; that later on, the indications for different types of bone grafts will multiply and in the coming years surgeons will specialize in bone grafting.

W. A. BRENNAN.

**Chalier, A.: Treatment of Bone Fistulæ of War Wounds** (La guérison des fistules ostéopathiques de guerre). *Lyon chirurg.*, 1918-1919, xv, 732.

Chalier reports 32 cases of bone fistulæ in which he obtained recoveries after extensive opening-up operations. The whole fistula and the surrounding cicatricial tissue of the soft parts were excised, the bone tract widely opened up, and splinters and all diseased tissue removed until healthy bone was reached. The bone was then smoothed off and the operation ended by primary suture. In dealing with the bone the subperiosteal method was employed. In a few cases it was necessary to remove the sutures, but in only one was there a recurrence of the fistula.

W. A. BRENNAN.

**Andrews, E. W.: Multiple Drilling of Fractures—An Old-Fashioned Operation Revised.** *Surg. Clin. Chicago*, 1919, iii, 243.

The complications and drawbacks to the use of plates and foreign bodies in simple fractures of the long bones are far too common. Because of the fact that in the best of clinics the use of Lane



plates and Parham-Martin bands has given a large percentage of infections and unsatisfactory results, the author made a study of Lane's method.

According to Lane's technique, nothing except steel instruments, thoroughly sterilized, touches the inside of the wound; no fingers, however carefully gloved and no needle or thread which has touched the fingers; nothing but the steel instrument goes within the skin. This means that all ligatures must be knotted with a pair of forceps and that all needles must be threaded without handling.

In spite of the greatest care, however, the author found no absolute immunity from secondary infection in the use of bone plates, wires, bands, and intramedullary pegs. Therefore, it was necessary to seek some substitute for the routine use of these crude appliances.

Two cases are cited: a fracture at the lower third of the tibia and one at the middle third of the radius. In both of these the Parham-Martin band was used. Both were cases of non-union, with the bones in perfect apposition. The non-union is attributed to the cutting off of the nutrition by the powerful band. In both instances the band had to be removed and the author resorted to the multiple drilling operation, according to the method of Brainerd, a pioneer surgeon of Chicago and the West, who early discovered that all ununited fractures could be made to mend by perforating their adjacent ends with multiple drill holes.

The drilling is done between the opposing fragments, but usually it is a mere perforation, preferably in an oblique direction, from one fragment across to the other. In this way from six to twenty small holes were made to irritate the ends of the fragments. This procedure was carried out through two small skin punctures and the wound immediately sealed after the drilling was completed. Within a few days after such treatment, rapid hyperplastic irritation and new bone formation took place. In ten to fourteen days, if there was no sharp osteitis and swelling around the broken ends, the drilling was repeated. Thus in one or two stages the exudation of the provisional callus was so stimulated that rapid bony union followed.

The author now uses an electric rotary hand-drill through a single opening, drilling about a dozen holes obliquely from one fragment to another. Ordinarily, a general anæsthetic must be employed. The subsequent application of a cast is not always necessary. A cast is not required, for example, in fractures of the tibia when the fibula is intact and acts as a splint.

P. H. KREUSCHER.

**Mauclair: The Various Tendon Operations to Remedy Radial Paralysis** (Les différentes opérations tendineuses pour remédier aux paralysies radiales). *Rev. d'orthop.*, 1919, vi, 413.

The author gives the histories of six cases in which he performed tendon transplantations to

remedy radial paralyses resulting from war injuries. The technique adopted was the anastomosis of the tendons of the long and short palmar muscles and the anterior cubital to the common extensor of the fingers and the extensor of the thumb, the anterior cubital tendon being sutured to the two internal tendons of the common extensor and the tendons of the long and short palmar to its two external tendons. These two packets of extensor tendons were then sutured together. The technique is a slight modification of that originally practised by Hoffa.

A tendon operation of this kind may be primary when there is a very extensive loss in the radial nerve and it is not intended to perform a direct nerve operation. As a secondary operation it is indicated in wounds with radial-nerve disruption in which after a long period there are no signs whatever of regeneration of the function of the nerve affected.

As immediate results the operation has made possible slight movements of the wrist and phalanges even after a few days. The end-results are most satisfactory, but while extension of the hand is quite sufficient, flexion has not been complete. This disturbance in flexion is noticed especially when the operation is performed late.

The author believes that for radial paralysis tendon anastomosis is preferable to grafting a strip of fascia lata into the wrist, arthrodesis of the wrist, nerve anastomosis, or the use of the most perfect orthopedic apparatus.

W. A. BRENNAN.

**Batten, H. E.: Treatment of Drop Wrist by Tendon Transplantation.** *Med. Press*, 1919, cvii, 333.

In drop wrist due to injury of the musculospiral nerve or injury to the muscle bellies of the extensor muscles of the forearm, tendon transplantation gives a very good result when the median and ulnar nerves are intact and the flexor muscles are normal. If the musculospiral nerve has not lost much substance, end-to-end suture may be done in preference to tendon transplantation.

The muscles chosen for transplantation are the pronator radii teres, the flexor carpi radialis, and the palmaris longus. The tendons of these muscles are sutured into the tendons of the extensor muscles. Early motion is encouraged though a splint is used. The latter is removed daily in order to instruct the patient in the use of the new muscles.

I. E. BISHKOW.

**Yvert, A.: New Case of Inter-Ilio or Ilio-Abdominal Disarticulation for Osteosarcoma of the Pelvis** (Nouveau cas de désarticulation inter-ilio ou ilio-abdominale pour ostéo-sarcome du bassin). *Rev. de chir.*, Par., 1918, lv, 93.

The author gives the clinical history of a case of an enormous sarcomatous tumor of the right iliac region for the eradication of which he performed an inter-ilio or ilio-abdominal disarticulation. This



case was that of a young man aged 18 years who had no history of traumatism or other circumstance which might account for the presence of the tumor. While surgical treatment gave only a slight chance for recovery, death would have been certain within a few months without such treatment. The patient stood the long operation well and made a good recovery from the anæsthesia, without evidence of shock, but sank and died of syncope a few hours later.

The tumor was 14 cms. deep and 17 cms. wide. Histological examination showed it to be a fibrosarcoma.

In his review of the literature the author found only 16 similar cases. In 13, the disarticulation was done for osteosarcoma, and in 3, for coxalgia. In 10, death followed immediately or rapidly; in 2, there was a temporary respite with recurrence after five or six months; and in 4, recoveries which were considered definite. Adding together the deaths which occurred immediately or after very early recurrence, the mortality was 75 per cent.

From the point of view of the conditions for which the operation was performed the author found that in 13 tumor cases there were 9 immediate deaths, 2 recurrences, and 2 definite recoveries. While in the 3 cases of coxalgia there was 1 immediate or early death and 2 definite recoveries.

Pagenstecher mentions 24 of this type of case in which 7 of the patients survived. The author cannot verify these figures, but if they are correct the prognosis is much less unfavorable than in the statistics here given. He believes that if intervention were carried out in two stages it might be more successful.

In a similar case reported by Morestin the hip was first disarticulated and the inter-ilio-abdominal operation performed a year later. This operation was for coxalgia and the patient made a definite recovery.

The author discusses the justifications for the operation and its indications and contra-indications. In his opinion it is the surgeon's duty to give the patient even a slender chance of life in an otherwise hopeless condition whenever there is no absolute contra-indication from verified metastases or the general condition.

The operation under discussion is itself quite well established in all its details and the technique may be varied according to the clinical conditions present. It is the only means which offers a chance of life when the pelvic tumor is too far advanced to be treated by partial or total pelvic resection.

In technique the author prefers the hæmostatic method of Momburg to the use of Esmarch's hæmostatic band. Hæmostasis can be improved also by the administration of chloride of calcium before the operation. Shock is the great cause of death, and if in the future this can be obviated, the greatest obstacle to the successful issue of inter-ilio-abdominal disarticulation will be removed.

W. A. BRENNAN.

#### Steindler, A.: Report on Forty-Eight Cases of Tendon Transplantation of the Foot. Physiological Method. *J. Orthop. Surg.*, 1919, iv, 187.

The author has previously emphasized the advisability of preserving the physiological integrity of the tendon in transplantation and surgical manipulation and especially of preserving or reconstructing the normal gliding apparatus of the tendon. In addition, the mesotendon of certain tendons should be preserved for the sake of their nutrition. In other words, stripping procedures should be avoided as they predispose to degeneration. In many cases extensive tendon transplantations should be superseded by arthrodesis.

Tendon transplantation in the ankle resolves itself into three or four problems because only a few tendons have mesotendons lending themselves to transplantation.

In paralysis of the tibialis anticus alone or combined with slight paralysis of the extensor tendons of the foot, the extensor longus hallucis is substituted for the tibialis anticus. If the tibialis posticus is capable of function, the weaker extensor hallucis may be substituted satisfactorily for the tibialis anticus.

In paralysis of the tibialis posticus the long flexors of the toes which lie in the same sheath are substituted.

In paralytic pes calcaneus of moderate degree only, with paresis of the gastrocnemius, the peroneal tendons are substituted. An incision made midway between the outer edges of the tendo achillis and the posterior edge of the peroneal tendons affords access to both, and side-to-side attachment can be effected without interfering with the mesotendon.

The technique for substituting the peroneus longus for a paralyzed tibialis anticus has been described by Leo Mayer. The peroneus longus muscle and tendon are isolated by a long incision, liberated high up, inserted into the sheath of the tibialis anticus, and anchored in the scaphoid.

For combined paralysis of the tibialis anticus and posticus, a double operation is performed, the extensor longus hallucis being substituted for the tibialis anticus, and the flexor of the big toe for the tibialis posticus.

In paralysis of the tibialis anticus and gastrocnemius the extensor hallucis is substituted for the tibialis anticus and the peroneal for the gastrocnemius. In paralysis of the tibialis posticus and gastrocnemius the flexor of the great toe is substituted for the tibialis posticus and the peroneal for the gastrocnemius.

In cases of triple paralysis a triple transplantation is done, i. e., the extensor hallucis is substituted for the tibialis anticus, the flexor hallucis for the tibialis posticus, and the peroneal for the gastrocnemius.

Aside from its disregard of physiological principles, the main reason that tendon transplantation has fallen into disrepute is the fact that the method has been unduly applied to cases in which arthrodesis was indicated.

L. C. DONNELLY.



## SURGERY OF THE SPINAL COLUMN AND CORD

**Sachs, E.: Some Observations on Spinal Cord Surgery, with Demonstration of Specimens.** *J. Missouri M. Ass.*, 1919, xvi, 109.

Forty-five cases are reported. Most of the patients had had their symptoms a long time. In practically every case there was spasticity of the lower limbs, and in many, sensory disturbances.

Bright yellow fluid obtained on lumbar puncture indicates the presence of a tumor. Pain is not a common symptom. Paræsthesia is observed frequently. The element of time is not of so much importance in the prognosis as the rate of growth of the tumor and its pathologic type.

Intramedullary tumors are rare. All extramedullary tumors are operable and the majority are benign, differing from cerebral tumors. In 27 cases in which operation was performed the diagnosis of tumor was erroneous in 3. The mortality from operation was  $9\frac{1}{2}$  per cent.

In 9 cases a posterior root section for spasticity was done.

The last group discussed were cases of fracture of the spine. When in this condition there is complete paraplegia, operation should be performed in the first twenty-four hours. I. E. BISHKOW.

**De Martel, I.: The Operative Treatment of Tumors of the Spinal Cord and Its Membranes; 20 Personal Cases** (Le traitement opératoire des tumeurs de la moelle et de ses enveloppes, d'après vingt cas personnels). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 511.

Attention is called to the necessity in these cases for very close collaboration between a thoroughly skilled neurologist and the surgeon.

General anæsthesia by chloroform or ether should be employed, ether being preferred. The patient should be placed in ventral decubitus.

Before beginning to operate it is necessary to seek the spinal processes corresponding to the tumor with the greatest care. The accurate localization of the site of the tumor and the determination of the corresponding spinal processes are most important, for upon these depends the possibility of making a strictly limited laminectomy.

When the vertebral canal is opened it should be catheterized with a very soft pliable catheter. Great caution must be observed in opening the dura. It should be incised only when the contents of the dural sac cannot be evacuated by puncture. Placing the patient in a position somewhat analogous to the Trendelenburg position does not obviate accidents. If the spinal fluid does not flow satisfactorily, the use of the catheter should be continued until the obstacle is removed.

The exploration of the spinal cord and its membranes is the most delicate and crucial stage of the operation. It is here that the skill and experience

of the surgeon will be especially tested. An intramedullary tumor may be unnoticed by an inexperienced surgeon, as it is difficult, if not impossible, to describe the very slight changes of form, consistency, and appearance in the cord which are caused by such a tumor. In order to free an anterior tumor the vertebral column should be resected as much as necessary to relax the compression on the cord and enucleate the tumor as easily as possible.

Soft tumors can be aspirated. As regards intermedullary tumors, the author does not quite agree with Elsberg's opinion as to the zones in which the cord should be incised. From his own experience he has found that a cord which contains a tumor is so deformed that the area where the incision should be made cannot be determined within 1 or 2 mms.

The liberation of the tumor ought to be done very gently. It is at this stage of the procedure that the complications occur which usually end in death. Of greatest importance here is the constant observation of the blood pressure. Fatal cases usually show a rapid fall in the pressure accompanied by hyperthermia, both of which result from irritation of the cord. The tumor should never be dragged in removing it.

After the operation and closure, hypophysis extract should be administered. The operation should be performed in a room kept at 37 degrees and the operative field irrigated with warm serum. Throughout the operation a Pachon blood-pressure apparatus should be attached to one of the patient's limbs. If a sudden drop is observed while manipulating the cord the operation should be stopped until the pressure recovers.

Short histories of the author's 20 cases are given. Eleven of the patients recovered and 9 died, a mortality of 45 per cent. W. A. BRENNAN.

**Guyot and Mauclaire: Traumatic and Lateral Luxation of the Second Lumbar Vertebra; Reduction Under General Anæsthesia** (Luxation traumatic et latérale de la 2<sup>e</sup> vertèbre lombaire; réduction sous anesthésie générale). *Rev. d'orthop.*, 1919, vii, 397.

Traumatic luxations of the lumbar vertebræ are very rare, many of the reported cases being in reality fractures with very marked displacement of the fragments. Since the introduction of radiography, however, luxations have been clearly demonstrated. Pieri recently collected 14 such cases from the literature, 7 of which were anterior lumbar luxations, and 7, lateral luxations.

The authors report a clinically and radiographically demonstrated case of complete luxation between the second and third lumbar vertebræ with lateral displacement of the second vertebra to the right



completely disassociating it from the superior vertebra.

The luxation, which was the result of trauma, was reduced under ether by opposing traction upon the spinal column and direct traction upon the limbs and the application of a plaster cast including the thorax, pelvis, and lower limbs as far as the knees. The traction upon the limbs was continued during the fixing of the plaster cast.

Five months after operation when the patient left the hospital the spine was quite straight and not painful, and extensive movements of the trunk were possible.

W. A. BRENNAN.

**Kidd, F.: The Treatment of the Bladder in Gunshot Injuries of the Spinal Cord.** *Brit. M. J.*, 1919, i, 397.

Before the war the medical profession seemed to be obsessed with the idea that very little could be done for those who had suffered gunshot injuries of the spinal cord which affected the bladder. This was because the old teaching was based largely on inadequate observation and false assumptions.

It was commonly taught that the bladder once paralyzed was unlikely to recover; that the trophic nerves to the bladder, being damaged, cystitis and pyelitis were almost inevitable; that an automatic bladder was an extreme rarity; and that patients with injured spinal cords seldom recovered from their paraplegia.

The author states that in this condition it is worth while making every effort to secure a clean automatic bladder. Only by so doing can the chief causes of death be done away with and the patient enabled to live a life of comfort. In some favorable cases recovery from the paraplegia may be hoped for.

The author presents an abstract of the researches of Head and Riddoch and states that their work has shown how to make use of mass reflexes in gunshot wounds of the spinal cord and thus abolish the necessity for the permanent use of the catheter.

To obtain an automatic bladder the paralyzed bladder must never be permitted to become over-distended and stretched and must be guarded against severe infection.

During the war the practice has been to deal with the paralyzed bladder in cases of gunshot wounds of

the spinal cord by passing a catheter intermittently, performing a suprapubic cystotomy, or by emptying the bladder at frequent intervals by massage and pressure above the pubes.

The author has used the method of the "tied in catheter" which he states is best fitted to establish an automatic bladder.

In intermittent catheterization there is grave danger to life from cystitis and pyelitis and the bladder wall becomes stretched because of over-distension. Subsequently, because of sepsis and stretching, the bladder wall is transformed into a fibrous envelope which loses its power to contract automatically forever.

Suprapubic cystotomy is followed by severe cystitis with consequent pyelitis or stone formation. Moreover, even if the automatic bladder becomes established, it is difficult to get the suprapubic fistula to heal permanently.

The method of mechanical expression by pressure and massage may diminish the danger of infection, but must be carried out four times a day, and this demands much time and patience on the part of the surgeon and nurses.

The author's method of "the tied in catheter" saves the surgeon's time, renders the nursing less arduous, and adds to the patient's comfort. There is no bleeding of the urethra, no stretching of the bladder, sepsis is mild and easily controlled, the urine can be kept acid so that stones do not form, and pyelitis is less likely to supervene. It is necessary to change the catheter only twice a week.

In six to eight weeks, if the bladder has not been stretched and has not become too septic and if in other respects the patient's general condition is good, it will be found that automatic flushing of the bladder has become well established, and the need for further catheterization and lavage can be largely, if not wholly, dispensed with.

In any lesion of the spinal cord above the cauda equina, an automatic bladder becomes established in three to six weeks, or occasionally in a little longer time, if the bladder is not allowed to become over-distended.

The patient can learn to induce automatic flushing by tickling the skin of the abdomen or by deep breathing.

V. C. HUNT.

## SURGERY OF THE NERVOUS SYSTEM

**McMurray, T. P.: Discussion of the Indications, Technique, and Results of Transplantation in Gunshot Injuries of Nerves.** *J. Orthop. Surg.*, 1919, i, 125.

Tendon transplantation is the author's operation of choice in cases in which nerve suture has failed or cannot be performed. When there is a loss of muscle or the nerves have been exposed in septic fields for long periods, nerve suture is of no value.

**Fore-arm:** In the fore-arm there are three muscles which may be used for transplantation without loss of power, the flexor carpi radialis, the flexor carpi ulnaris, and the pronator radii teres. The problems met with are injuries of: (1) the musculospiral nerve; (2) the ulnar nerve; and (3) the median nerve.

In injuries of the musculospiral nerve the pronator radii teres is usually inserted into the extensor carpi radialis brevis and longior. The flexor carpi



radialis and flexor carpi ulnaris are also used, the former being inserted into the two extensors of the thumb and the extensor of the index finger and the latter into the common extensors of the fingers. After the operation the hand is maintained in dorsiflexion with the fingers flexed ten degrees.

In many cases of injuries of the ulnar nerve no transplantation is required. All that can be done in the way of transplantation is to sew the two outer tendons of the flexor profundus median to its two inner tendons.

Tendon transplantation in injuries of the median nerve consists in inserting the extensor carpi radialis longior into the flexor longus pollicis. In such injuries the thumb is often quite useless.

Shoulder-joint: Tendon transplantation for paral-

ysis of the deltoid is not successful and an arthrodesis of the shoulder joint is much better.

Lower limbs: In cases of injury to the anterior crural nerve with paralysis of the quadriceps, which is usually partial, the author recommends the use of the biceps alone or the semitendinosus and gracilis. Many persons with injury of this kind, however, recover spontaneously.

The treatment of injury of the external popliteal nerve is tenodesis of the tibialis anticus and peroneus brevis.

When the internal popliteal nerve is injured splints should be used to keep the foot from dorsiflexion, and the inner border of the tendo achillis should be fixed through a hole in the bone.

C. C. CHATTERTON.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSSES, ETC.

**Johnson, W.:** Symptoms of Hyperthyroidism Observed in Exhausted Soldiers. *Brit. M. J.*, 1919, i, 335.

Notes were made on 50 cases near the front in 1917. The author mentions Cannon's experimental work on the relation of internal secretions to the emotional state and especially the increased activity of the adrenal and thyroid glands. He expresses the belief that the exhausted condition of soldiers who had been subjected to the strain of prolonged fighting might be due to the pathologic effect of excessive stimulation of the glands of internal secretion.

In the group observed, 7 patients presented a frank picture of Grave's disease, and 43, some degree of exophthalmos. Only one gave a history of thyroid trouble. Their ages ranged between 23 and 35 years. All had lost weight and were sleepless and easily worried and excited. The skin was pale, moist, and often cyanotic, and the pulse varied widely with exertion. A temporary functional murmur associated with slight dilatation was sometimes noted. The reflexes were generally exaggerated and a tremor was almost constantly present.

Under proper care, with rest and good food, marked improvement was noted within ten days, although some of the patients showed signs of hyperthyroidism after several weeks.

The author suggests that possibly many of the patients who are classified at the base hospital as suffering from psychoneuroses may have previously passed through a pathologic state due to overstimulation of the ductless glands. E. M. MILLER.

**Bayliss, W. M.:** General Discussion on Shock. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, 1.

The following is a brief summary of the conclusions drawn by the Special Investigation Committee

of the Medical Research Committee of the Royal Society of Medicine to co-ordinate work on shock and allied conditions during the war.

Bayliss defines traumatic, surgical, or secondary shock as a state of collapse associated with low blood pressure which produces a deficient circulation of blood and deprives the tissues of the necessary supply of oxygen. "Primary shock" or "collapse" as referred to by Crile is doubtless of nervous origin, is analogous to fainting, and differs from the latter only by its greater severity and longer duration. Low blood pressure is the most important feature and when the pressure is restored the other symptoms disappear.

It has gradually come to be realized that the chief factor in shock is a deficiency in the volume of blood in circulation. It is probable that the blood is held up somewhere in dilated areas of the vascular system, and by a process of exclusion it is assumed that the region in question is the capillaries.

By experimentation it has been found that injury of large masses of muscular tissue is especially liable to produce shock. When the thigh muscles of a cat are crushed a fall of blood pressure follows. This phenomenon does not originate in the central nervous system, for cutting the cord above the origin of the nerves of the limb does not prevent the fall of blood pressure, while clamping the artery and vein does prevent it. Some chemical product of the injured tissue must be the responsible agent.

It has been demonstrated that a base, histamine, has the remarkable effect of powerfully dilating the capillaries but not the arterioles, and in large doses produces a condition of profound shock. It is believed that a substance of this kind is produced in injured and disintegrating tissues and is augmented by any cause tending to depress the circulation, such as cold, anxiety, fatigue, thirst, and hæmorrhage.

The treatment of shock is obviously to increase



the volume of blood in circulation. This may be done by transfusion of blood or the introduction of saline. The addition of sodium bicarbonate or calcium salt has no special effect, but a colloid, such as gum arabic, attracts water by its osmotic pressure and thus keeps the solution in the blood vessels for a longer period of time. A 6 to 7 per cent solution of sodium bicarbonate in a 0.9 per cent sodium chloride solution is correct. The hæmoglobin may be reduced to 25 per cent.

In actual practice all patients in shock are put to bed, made warm, and given plenty of water to drink. If not improved in thirty minutes, 750 cc. of warmed gum saline is given intravenously. If benefit is derived in thirty minutes, another 750 cc. of gum solution is given, but if no improvement is noted from the first, a transfusion of blood is prescribed instead of a second injection of the gum saline.

In his discussion of the paper, Dale stated that in his opinion the most probable cause of shock is the presence of a toxin with an action analogous to that of histamine. Products showing this type of action have been extracted from almost all of the organs of the body. They are present in great abundance in the small intestines and appear to be set free readily from almost any tissue as the result of injury or even arrest of the circulation.

Histamine causes the same paradoxical features as those seen in secondary shock. It produces a contraction of all plain muscle, including that of the arteries and arterioles, but at the same time causes a vasodilatation of the capillaries and a marked fall in the arterial pressure. Loss of plasma into the tissues is indicated by the rapid rise in the percentage of corpuscles in the blood. Under normal conditions only a limited portion of the capillary network is serving at any one moment and a simultaneous opening up of the whole network would practically empty the heart and large vessels.

Malcolm's contention in the discussion was that, whether caused by an irritant circulating in the tissues or by direct stimulation of sensory nerves in the course of an injury, the vascular changes characteristic of shock are brought about reflexly through the nervous system. Stimulation of the sensory nerves results in a contraction of the blood-vessels throughout the body, and the simplest as well as the most complete explanation of the phenomena of uncomplicated surgical shock is found in the view that its primary change is a reflex contraction of the blood vessels proportionate in degree to the intensity of the irritation of the sensory nerves. A profound degree of shock may be brought about instantaneously, too quickly it seems to be explained by any other than nervous origin.

The conception of shock as arising primarily from a reflex vascular contraction extending from the periphery to the center fully explains every change that is known to take place in that condition. The tensely contracted vessels fully account for the blanched appearance of the skin, the collapsed condition of the patient, the fall in temperature, and

death, if death occurs. This bloodless condition of the skin does not interfere with the action of the sweat glands which secrete profusely, the patient's bed often being soaked with moisture. The sweat glands functionate without reference to the circulation, as proved by the fact that they may be made to functionate in the foot of a dead cat. The starvation of tissue is also a sufficient cause of the acidosis of shock, the state of acidosis being a result, not a cause. The great fall in blood pressure is not inconsistent with a contracted state of the vascular system in the presence of a great reduction of fluid in the vessels, the plasma having escaped into the tissues and part, at least, having been lost in the sweat. Malcolm took issue with the statement of the research committee in their report that "if in wound-shock the lost blood is not in the arteries and probably not in the veins, it must be mainly stagnant in the capillaries." He asked why it should not be mainly out of the blood vessels altogether.

Wallace called attention to the resemblance between shock, peritonitis, hæmorrhage, and intoxication from gas gangrene. Patients suffering from gas gangrene and presenting all the appearances of shock are relieved in a few hours by amputation of the gangrenous limb or the ablation of the infected muscle. Other patients presenting the typical picture of shock exhibit but slight injuries, as proved at postmortem. Therefore it would seem that beside toxæmia, loss of heat, and loss of blood, still another factor must be sought as the cause of shock.

Mott stated that in the brains of patients suffering from shell shock hæmorrhages into the sheaths of the vessels and minute scattered hæmorrhages into the brain substance have been found. This bleeding was due to the rupture of very small vessels and not to a hyaline thrombosis of terminal arteries such as is present in shell shock with gas poisoning. In wound, burn, and shell shock, there is evidence of engorgement of the veins of the meninges and substance of the brain associated with venous and capillary stasis. Still more marked is the evidence of anæmia characterized by empty, collapsed vessels with dilated peri-adventitial spaces. In only two cases was fatty embolism found and then in insufficient degree to account for the fatal shock.

Walker discussed the treatment of shock in civil practice. Whether the patient is affected with shock or hæmorrhage, the blood volume drops to 60 or even 50 per cent of its original amount and the treatment consists primarily in keeping up the fluid reserve by transfusion and the injection of a liter or more of saline with 2 per cent of sodium bicarbonate. In addition to this, a continuous rectal saline is given and as much fluid as the patient can take by mouth. The anæsthetic is important, gas-oxygen followed by oxygen for half an hour being the best method of bringing the blood pressure back to normal.

In regard to transfusions, Bond has observed that



when the blood sera of different persons are incubated together they vary greatly in their action on foreign leucocytes. If this is true in transfused blood, the question of compatibility arises not only in regard to the action of a serum on the red cells but also in regard to its action on the leucocytes of the donor.

Arbuthnot Lane has always held that shock is a condition of acute intestinal auto-intoxication, the responsible factor being the large amount of toxic material carried from the small intestines to the liver through the portal circulation. In his experience in this war he has noticed that the amount of shock and its consequences have borne a direct relationship to the degree of infection of the gastrointestinal tract.

Lockhart-Mummery in discussing the paper stated that there are several different physiological conditions which are often described as surgical shock. The shock seen in the operating room is one thing and the vasomotor theory of its causation is correct. It can be entirely avoided, but when it does occur it is best treated by morphia, pituitary extract, complete rest, warmth, and the administration of fluids. Toxic shock, such as that seen in cases of burns, infections from gunshot wounds, etc., is quite another thing, and being a toxæmia, is best treated by flooding the tissues with fluids. He took issue with the members of the committee who held that shock is essentially a toxæmia, since in certain types of cases there is no cause for toxæmia. He maintained that the weakest point in this theory is that, no new methods of treatment have been suggested.

P. W. SWEET.

**Porter, W. T.: Fat Embolism Shock is Not Explained by Embolism of the Lungs.** *Boston M. & S. J.*, 1919, clxxx, 531.

In February, 1917, Porter demonstrated that the fall of arterial pressure and the other symptoms of wound shock can be produced by the injection of neutral olive oil into the external jugular vein.

In May and June of that year observations made at the Massif de Moronvillers and the Chemin des Dames confirmed the statement made to the author at the Carrel Hospital in Compiègne, that shock is most frequent after shell fracture of the femur and after multiple wounds through the subcutaneous fat, i. e., conditions in which much fat enters the blood with resultant infarction of the lungs, the brain, and other organs.

These facts led to the conclusion that fat embolism is the most frequent cause of wound shock upon the battlefield.

Shortly thereafter several physiologists and many surgeons denied that fat embolism could properly be called a cause of wound shock. The results were to be explained, they believed, by embolism of the lungs. This contention was completely overthrown in July, 1918, however, when shock was produced by the infarction of the vasomotor region through the injection of a minute

quantity of oil (0.1 cc. per kilo) into the central end of the vertebral artery. In sections stained with scarlet red, vessels of the vasomotor region were seen to be plugged with oil.

It has seemed worth while to prove also by two other methods that fat embolism shock cannot be explained by embolism of the lungs.

By the first of these methods shock is produced by injections through the central end of the carotid artery. This may excite surprise. Not long ago, an experimenter of repute strengthened the case for embolism of the lungs, as he thought, by failing to produce shock by means of injections of oil into the central end of the carotid artery. His failure to lower the blood pressure by embolism of the brain seemed to leave the field clear for embolism of the lungs. He could hardly have forgotten, however, that the vasomotor region is supplied by the basilar artery and not by the carotid.

The second of the two new methods compares two procedures, A and B, in each of which 0.5 cc. of neutral olive oil per kilo of body weight is injected into the external jugular vein of cats. The rate of inflow is about 1 cc. in 15 seconds.

In Series A both carotid arteries were closed but both vertebral arteries were free. As a rule shock resulted. In Series B both carotid arteries were free but both vertebral arteries were closed. Shock seldom resulted.

The three methods described lead to the same conclusion. Fat embolism shock is not explained by embolism of the lungs.

G. E. BEILBY.

**Moire, P., and Sorrel, E.: The Surgical Complications Following Exanthematous Typhus** (Les complications chirurgicales consécutives au typhus exanthématique). *J. de chir.*, Par., 1919, xv, 156.

The authors refer to the epidemic of typhus which occurred in Roumania in 1917. Owing to the cold and famine, those convalescing from typhus were in such a condition of misery that they easily became victims of secondary infections.

The majority of the surgical complications following exanthematous typhus were of a suppurative type due to secondary bacterial infection, particularly by the streptococcus. The point of origin of these streptococcal infections was usually a scar or buccopharyngeal ulceration. Gangrene is excepted. Obliterating arteritis is perhaps due to some still unknown bacterium.

The clinical aspect of all these complications is generally subacute. As a rule the prognosis is based on the general state rather than the local condition. The exhausted fever patients die from the lack of strength to react against the infection. Treatment must therefore include the improvement of the general condition as well as local treatment. The local treatment varies with the circumstances and must be given in stages depending upon the patient's condition. General anæsthesia should be avoided and when necessary should be short.



In all suppurative collections after evacuation of the pus and curettage of the area the authors have employed the Dakin-Carrel method of irrigation which they found disinfected the operative wound sufficiently to enable them to proceed to secondary suture in spite of the presence of streptococci. It is possible that the bacteria were not highly virulent or that owing to repeated infections, the patients had acquired a certain degree of immunity.

The authors give details and illustrations of the laryngeal, ocular, subcutaneous, gangrenous, and other types of typhus complications, especially gangrene of the lower extremities.

W. A. BRENNAN.

**Kouindjy, P.: Physiotherapy in the Treatment of Osteomata.** *N. York M. J.*, 1919, cix, 709.

Two cases of osteomata of the lower extremities not due to fracture and cured by physiotherapeutic methods are reported.

Case 1. The patient had had an operation for club foot when three weeks old, and at 7 years of age, a tenotomy. During military exercises pain was felt in the tendo achillis. After a wound was received in the leg this pain recurred and the X-ray showed the presence of abnormal deposits of bone. The treatment consisted of hot baths, massage, manual movements, and re-education in walking.

Case 2. Osteoma of the lower part of the femur following a shell wound in the thigh. The X-ray showed the presence of a large bony mass completely separated from the shaft. Treatment consisted of massage and other therapeutic measures.

The etiological factors of osteomata are syphilis, rheumatism, chronic arthritis, and traumatism. According to Reyneir's theory, the production of osteomata in the tendons is due to the fact that the latter are adherent to bone substance and irritation results in proliferation of the bone-cells (osteoblasts).

C. C. CHATTERTON.

## BLOOD

**Charles, R., and Sladden, A. F.: Resuscitation Work in a Casualty Clearing Station.** *Brit. M. J.*, 1919, i, 402.

This report deals with work among wounded men received in a tented clearing station during three weeks of activity on a sector of the western front from Sept. 27 to Oct. 15, 1918.

Gas and oxygen anæsthesia given by means of Boyle's apparatus was a very great aid to successful resuscitation in all types of severe shock.

In the resuscitation the general lines of such treatment were followed. Warmth applied by hot air and hot water bottles was the first and most important element. The quenching of thirst by water, sweetened lemonade, and other mild drinks was an insistent need and a useful aid. Sedatives and cardiac stimulants were administered when desirable. When possible, morphine was not given

in doses larger than  $\frac{1}{4}$  gr. nor oftener than once in twelve hours.

Intravenous injections were used largely in the worst cases. If there was obvious bleeding not controllable by mechanical means, it was thought better to avoid methods which would increase the blood pressure. Otherwise gum infusion was given unless the case seemed very urgent, when blood transfusion was preferred. Operation was always performed as soon as possible, and as a general rule blood transfusion was reserved for the postoperative stage when all bleeding points had been tied.

For practical purposes the cases of patients who died within forty-eight hours of admission have been regarded as failures from the standpoint of resuscitation. The later deaths were not regarded as resuscitation failures.

Blood transfusion or gum infusion was given in 74 instances, and in 23 (31 per cent) was unsuccessful. This group included most of the severe wounds of the limbs and a few chest, abdominal, and cranial cases. Generally the patients exhibiting shock with less severe hæmorrhage were given gum infusion in the first instance, blood transfusion being withheld unless the gum did not cause sufficient benefit. To patients who before operation were in fair condition, but on whom a prolonged operation was expected to produce more shock, gum infusion was given with satisfactory results. When there was evidence of severe hæmorrhage, blood was given as early as possible. In this series the giving of blood was therefore restricted to a class of patients who were in worse condition than those to whom gum infusion was administered.

In a few postoperative cases in which gas-gangrene tissue was found, a solution of 2 per cent sodium bicarbonate and 6 per cent glucose in distilled water was given with benefit. After operation in abdominal cases, and in some major amputations, rectal infusions of 5 per cent sodium bicarbonate and 5 per cent glucose were used.

In the transfusions of blood, walking wounded patients acted as donors. The macroscopical grouping test was made, and when possible a donor was procured who belonged to the same group as the recipient. Otherwise the transfusion was made from a Group IV donor. The whole-blood method with the Vincent tube and the citrate methods were used, the latter more commonly.

From a review of this collection of cases it can be deduced only that the transfusion of blood was distinctly better than the use of gum infusion. While a certain class of patients receive sufficient benefit from gum infusion, others when treated with gum infusion fail to improve but show great benefit from subsequent blood transfusion. Some patients in pure shock without loss of much blood seem to derive no benefit from either method.

The results of intravenous treatment show a uniformly lower percentage of failure with blood than with gum infusion. General improvement is more obvious six or twelve hours later than immediately



following the treatment. However, the author has seen no ill effects ascribable to the use of gum infusion.

V. C. HUNT.

**Ecker, E. E.: Survey of Wassermann Reactions Made in the Serologic Laboratory of the City of Cleveland.** *Am. J. Syphilis*, 1919, iii, 260.

This article reports the results of approximately 10,000 Wassermann tests made on patients with suspicious histories or obscure symptoms.

The tables prepared by the author show that syphilis occurs most frequently in both men and women between the ages of 26 and 40. Between the sixteenth and twenty-fifth years the incidence is higher in females because of their earlier maturity. The percentage of positive tests was 23.71 in males and 24.09 in females. Among married patients the percentage of positives was 27.48, while among those who were unmarried it was 25.21. The percentage of positives among negroes was double that among whites.

I. E. BISHKOW.

**Smythe, G.: Effects of Moderate Exercise on Blood Pressure.** *Practitioner*, 1919, cii, 205.

The auscultatory method of estimating blood pressure is best. Tests were made on men in the army before physical training and after an hour of physical exercise. The pulse rate and the systolic and diastolic blood pressure were determined. The results obtained showed that the average pulse pressure is 39 mms. and is lowered to 35 mms. after exercise. The average pulse rate in the series was 78 beats per minute, both before and after exercise. The average systolic blood pressure in a man between the ages of 18 and 39 is 125 mms. and in the majority of cases is lowered after moderate exercise. This decrease is caused mainly by the dilatation of the arteries and capillaries and not by fatigue of the heart muscle. The average diastolic blood pressure is 86 mms. and is unaltered by exercise.

The effects of moderate exercise on the system are beneficial inasmuch as the peripheral dilatation caused thereby increases the warmth of the skin and promotes perspiration without taxing the heart. After physical training on Swedish lines, the man finishes up unexhausted and fresh.

I. E. BISHKOW.

**Ward, E. H. P.: Tumors of the Blood.** *Med. Rec.*, 1919, xcv, 434.

The author refers to a former article in which the view was advanced that all tumors are due to an arrest in the development of the cells of the tissue involved. The aberrant cells fail to function normally and to a greater or less degree revert to the type of their unicellular ancestors.

The tumor affects the general organism, first, by the failure of the cells to perform their proper function; second, by its own mechanical effect and that of its metastases; and, third, by the production of toxins due to altered metabolism and the degeneration of its cells and their supporting tissues.

Individual cells may suffer arrested development just as entire organs may fall short of a full degree of development, and those thus affected form the basis of tumors.

An arrest in the development of the cells of the blood results in conditions which are analogous to tumors from other diverted cells.

In pernicious anæmia there is proliferation of the erythroblastic tissue with metastases to the marrow of the long bones and the lymph glands. In myeloid leukæmia the tumor starts in the bone marrow, metastases being formed in the lymph glands, spleen, and other organs. In lymphoid leukæmia, the original tumor is in the lymph glands, and there are metastases to the skin, etc. Hodgkin's disease has its origin in the lymph glands and forms metastases in the spleen, long bones, liver, kidney, intestines, tonsils, etc. In the aplastic type of pernicious anæmia, there is a simple atrophy of the blood-forming tissues.

In all tissues except the most highly specialized arrested development results in the abnormal presence of cells which if normally developed would have formed the normal tissue of the region affected.

Highly specialized tissue, such as nerve cells, may exhibit this defect in a derangement of function rather than a derangement of form and manner of growth. An example of this is senile dementia which is comparable to the cancer of old age.

Referring to the essential development of the individual cell from an amoeboid form, the author states that that reversion toward this type involves the resumption of primitive characteristics which were formerly discarded, chief among which is the property of multiplication. This property persists as the lesion advances until the other pathologic factors result in degeneration.

V. E. DUDMAN.

**Huck, J. C.: Changes in the Blood Immediately Following Transfusion.** *Bull. Johns Hopkins Hosp.*, 1919, xxx, 63.

The ever-increasing use of transfusion as a therapeutic measure has stimulated the desire to obtain a clear explanation of the various changes that follow the introduction into one person of the blood of another. Some of the simplest questions raised by this procedure however, remain still unanswered. For instance, although it is generally known that after a transfusion the hæmoglobin and the red corpuscle values are increased, the exact way in which the increase occurs is not understood. Many have assumed that the immediate effect is entirely mechanical, that is, that the blood of the recipient is altered in direct proportion to the quantity of blood introduced just as though the two had been mixed in a vessel outside of the body; that later, reactions on the part of the blood-forming organs come into play, and these then take part in determining the succeeding change. No doubt the mechanical and reactive effects are both important, but the relative importance of each is not clearly defined. The an-



answer to this question will be of practical value, because it will influence us to use either small transfusions repeated frequently or larger transfusions given at longer intervals.

Certain observations already at hand cast considerable doubt upon the view that the immediate effects of transfusion are purely mechanical and lead at once to the anticipation that these effects will be neither constant nor quantitative.

In the investigation reported, transfusion was performed in each instance by a modification of the citrate method of Lewisohn as described by Sydenstricker, Rivers and Mason. Special care was taken in testing the donors to be certain that the bloods were compatible. The amounts of blood given in different cases varied from 250 cc. to 1,250 cc. Studies of the blood were made immediately before the injection, immediately afterward, and two hours, five hours, and about twenty-four hours later. In practically all of the cases, these time intervals were followed rather closely.

Each examination consisted of counts of the red cells and white cells and a differential count of 300 white cells. Platelets were estimated in the smears and a determination was made of the hæmoglobin. Notes were taken also on the morphology of the blood cells. The counts were always made with the same instruments and by the same observer with the same reagents, and care was taken to draw the blood from the same part of the body with uniform punctures.

The effect of transfusion was studied in seven cases of pernicious anæmia, two cases of idiopathic purpura, four of benzol poisoning, five of secondary anæmia, and two of Banti's disease.

The responses to transfusion were extremely variable. A few of the main points brought out were the following:

**Red blood cells:** In general, following the injection of blood there was an immediate increase in the red-cell count, the striking point being the marked increase which in many cases was apparently out of proportion to the quantity of blood introduced.

**Hæmoglobin:** The hæmoglobin in most cases showed a uniform rise following transfusion, usually reaching its maximum at the end of twenty-four hours. In some cases it fell slightly after the initial rise. The changes in the hæmoglobin did not run parallel with the changes in the red-cell count, as was seen best from the variations in the color index.

**Leucocytes:** In practically every case following transfusion there was some increase in the leucocytes. In several instances, however, they remained practically stationary or even fell. These relations did not seem to be constant in any particular type of case. In the differential count the most striking change was the increase in the polymorphonuclear neutrophils which was striking even in some in which there was little change in the total leucocyte count.

A general review of the immediate effect of transfusion upon the blood count in 20 cases did not reveal

any constant changes following the procedure. The point of practical interest and importance seems to be that no exact mechanical effect can be demonstrated following the introduction of definite quantities of blood. Whereas in a general way it may be said that the introduction of blood raises the count, the effect is essentially a biological effect which involves the redistribution of blood in the body and the exact nature of which is not at present understood.

G. E. BELLBY.

**Bluemel, C. S.: A Simple Method of Giving Intravenous Infusions.** *J. Am. M. Ass.*, 1919, lxxii, 993.

The following simple technique is used by Bluemel in giving intravenous infusions.

Nine grams of sodium chloride are placed in each of a number of clean quart medicine bottles. The bottles are then filled to the 1,000 cc. mark and closed with a two-hole stopper in one hole of which is a glass tube reaching to the bottom of the bottle and in the other a short tube projecting a short distance inside and out. The solutions are then sterilized, and when cooled to body temperature are ready for use.

A bottle is then placed in a sling of two copper wire loops and hung in an inverted position. To the projecting glass tubing is attached 6 or 8 feet of sterilized rubber tubing carrying a No. 17 or 18 Luer needle. The lumen of the observation tube is expanded at one point of the sphere to act as a trap to arrest the air bubbles. A hæmostat is clamped to the rubber tubing a few inches from the observation tube. The bottle is hung from 2 to 5 feet above the patient and before it is used enough fluid is allowed to flow through the needle to expel the air from the tubing.

A rubber bandage is placed around the patient's arm, and the veins are distended by repeated clenching of the fist. A suitable vein having been selected, the site is sterilized with alcohol. The needle is then inserted into the vein with a single thrust and when the blood appears in the observation tube, the rubber bandage is removed and the hæmostat is unclamped. An insufficiently distended vein, a poorly illuminated field of operation, or a blunt needle will cause difficulty in entering the vein. After the needle is withdrawn a wad of cotton is placed at the site of puncture and the arm held elevated for few minutes.

F. P. HAMMOND.

**Ashby, W.: The Determination of the Length of Life of Transfused Blood Corpuscles in Man.** *J. Exp. Med.*, 1919, xxix, 267.

In the attempts to discover the length of time that transfused corpuscles live and function, several methods have been employed. Injection of nucleated blood corpuscles (bird and frog) into animals having non-nucleated corpuscles is of no value as, being foreign proteids, they are destroyed.

Re-injection of stained corpuscles also involves the question of reaction against a foreign body.



Changes in the erythrocyte count in normal animals following transfusion indicate that transfused corpuscles live and functionate up to about nineteen to twenty-two days. This method of determining the length of life of the transfused corpuscles, however, is influenced by variation in the volume of the blood.

The method advanced by the author is to identify the transfused corpuscles by making use of the four blood groups.

From the agglutination properties of the four blood groups, it is known that persons in Group I may receive the blood of those belonging to any other group, and that the blood of those belonging in Group IV may be given to those belonging to any of the other groups. In transfusing blood of an unlike group danger arises only when there is agglutination of the incoming corpuscles, the transfused serum being too much diluted when mixed with the recipient's blood to produce agglutination of the latter's corpuscles. When blood the corpuscles of which are agglutinable is treated with serum capable of agglutinating it, the agglutination may be made practically complete if sufficient serum is used.

If agglutinable corpuscles are mixed with unagglutinable corpuscles, either by transfusion or in the test tube, a large number of free corpuscles are present in the proportion in which the two kinds of corpuscles are mixed.

By taking samples of a patient's blood from time to time after transfusion and differentially agglutinating the corpuscles, an estimate may be made from the number of unagglutinated corpuscles present as to the length of time the transfused corpuscles remain in the circulation.

The technique of this procedure is given in detail. It was found that a mixture of blood to serum in the proportions 1:22 gives the maximum agglutination. Shaking at intervals during incubation frees many unagglutinable corpuscles that would be caught in the clumps. Keeping the blood tubes on ice till the count is made gives more uniform results.

Blood is taken from the ear in a white-cell counting pipette to the 0.5 mark, the pipette then being filled to the 11 mark with the agglutinating serum to which a 4.4 per cent citrate solution has been mixed in the proportion 20:1. The whole amount is then expelled into a small test tube and shaken, a 1:22 mixture of blood and citrated serum being thus obtained.

This mixture is incubated at 37° C. for forty minutes with thorough shaking every ten minutes and left in the ice box over night. After thorough shaking, a count is made on the red-cell counting chamber, and the number of unagglutinated cells per cubic millimeter of blood is calculated.

From the use of the above technique and further laboratory tests, the methods of which are described minutely, the following conclusions are drawn:

1. In mixtures of corpuscles of different groups it is possible to separate the corpuscles practically

quantitatively by treating the mixture with a serum that agglutinates the corpuscles of one kind and leaves the others unagglutinated.

2. After a recipient has been given a transfusion of blood of a group other than his own, specimens of his blood treated with a serum that will agglutinate his corpuscles but not the transfused corpuscles show the presence of unagglutinated corpuscles in large numbers.

3. These unagglutinated corpuscles which appear in the recipient's blood after such a transfusion are the transfused corpuscles and their count is a quantitative indicator of the amount of transfused blood still in the recipient's circulation.

4. The life of the transfused corpuscle is long, having been found to continue for thirty days and more. The beneficial results of transfusion are without doubt due primarily not to a stimulating effect on the bone marrow, but, it is reasonable to assume, to the functioning of the transfused blood corpuscles.

V. E. DUDMAN.

**Tarr, T. S.: Intravenous Injections in Infancy. Advantages of the Superior Longitudinal Sinus Route.** *Arch. Pediat.*, 1919, xxxvi, 72.

After doing hundreds of vein punctures the writer is convinced that the less apparatus required the easier and safer the procedure. He uses only an ordinary 5 cc. Luer syringe and an ordinary 21- or even 23-gauge hypodermic needle an inch long. There is no objection to an 18-gauge needle, but a needle of smaller bore causes less pain, leaves a smaller bleeding point, and has always been found quite large enough.

Practically all of the hæmorrhagic diseases of the new-born are amenable to treatment, and regardless of the infant's condition the sinus can be entered with ease.

Blood serum when introduced into the longitudinal sinus acts more quickly than when given in any other way. When blood transfusion is indicated no time is to be lost, and the sinus route is by far the easiest and most satisfactory.

Diphtheria antitoxin, salvarsan, dextrose solution, and alkalies may also be given in this way quickly and safely. Camphor in oil when injected into the sinus acts almost instantly. In cases of diphtheria, syphilis, acidosis, and the toxic diarrhoeal diseases which occur in the summer months the general practitioner should not hesitate to use the sinus route for the administration of intravenous medication.

The conclusions drawn from his experience the author summarizes as follows:

1. The obtaining of blood for diagnostic purposes from the superior longitudinal sinus of an infant is safe and practical.

2. An ordinary Luer syringe and hypodermic needle is all the apparatus required.

3. Transfusion of blood by way of the sinus route is safe and can be done by the general practitioner in the average home.



4. Injections of medicinal solutions are safe and in many instances the solutions thus injected act promptly.

5. The use of the sinus route need not be considered a last resort.

H. J. VAN DEN BERG.

**Tompkins, E. H., Brittingham, H. H., and Drinker, C. K.:** *The Basal Metabolism in Anæmia, with Especial Reference to the Effect of Blood Transfusion on the Metabolism in Pernicious Anæmia.* *Arch. Int. Med.*, 1919, xxiii, 441.

The authors draw the following conclusions from their investigations: Transfusion in anæmia produces a diminution of metabolism, pulse rate, and respiratory activity, a drop in the temperature if it has been elevated, and a rise in the percentage of hæmoglobin and the simple blood count.

The data suggest that the metabolism of anæmic persons is dependent on two contending factors aside from any effect of compensatory muscular activity. In untreated acute cases there is evidently some type of stimulation to the body cells in general, the amount of which is indicated by the fall in metabolism after transfusion. In addition, coincident progressive tissue changes tend to reduce the metabolism and are represented by the diminished metabolism of the chronic cases and the low level to which the metabolism falls in practically all cases after transfusion.

MAX KAHN.

### BLOOD AND LYMPH VESSELS

**Sencert, L.:** *Wounds of the Trunk Vessels of the Base of the Neck and Their Surgical Treatment* (Les blessures des gros troncs vasculaires de la base du cou et leur traitement chirurgical). *J. de chir.*, 1919, xv, 101.

Wounds of the large vessels at the base of the neck are infrequent in war as in peace. However, the surgeon may be required to treat such wounds under the following conditions: primarily, at the casualty clearing station in extensive wounds of the neck causing serious external hæmorrhages, or restricted wounds complicated or not by arterial, venous, or arteriovenous hæmatomata; secondarily, either at the casualty clearing station or at the evacuation or base hospital, in the severe complications occurring suddenly or progressively during the evolution of apparently simple wounds of the base of the neck; and finally, in cases of traumatic aneurisms of the base of the neck, either arterial or arteriovenous.

When in cases of wounds at the base of the neck with the signs of hæmorrhage a swelling is present, the diagnosis of hæmatoma is fairly evident and its course can be traced with a certain degree of accuracy. If, however, no swelling is present, the diagnosis of a wound of the deep vessels is very difficult. The neck wound may be small and the hæmorrhage, whether external or internal, insignificant and not referred to the important vessels even when there is a serious vascular wound which is manifested only

later after the external wound has cicatrized. In 14 cases of wounds of the carotid vessels collected by Makins, 5 deaths resulted from secondary hæmorrhage, while in 7 cases of injuries of the subclavian vessels, 2 deaths occurred from the same cause.

The great desideratum in all vascular injuries is to obtain preventive hæmostasis, but this involves the possibility of being able to make a sufficient surgical exposure of the vessels involved. Sencert describes the present methods of exposing the trunk vessels at the base of the neck. While these afford considerable light on the deep-lying vessels, he believes them insufficient for the manipulation and suture of the vessels.

In order to expose the primary right carotid and the subclavian as far as the brachiocephalic trunk and the left primary carotid and subclavian as far as their entry into the thorax, Sencert makes a horizontal incision at the level of the upper edge of the clavicle, proceeding from the external third of this bone to about 2 cms. beyond the sternoclavicular articulation on the same side. At the external extremity of the incision the clavicle is exposed and sawed through, while at the internal angle of the incision the sternoclavicular articulation is exposed and disarticulated. The cutaneous incision is then extended downward in a curve toward the axillary fold, sectioning the subcutaneous and the muscular tissue. The whole osteocutaneous flap is then turned over outwardly, when the retroclavicular organs are largely exposed, including the trunk vessels and their branches.

By this method Sencert has been able to ligate the first part of the subclavian artery, extirpate an arteriovenous aneurism of the second and third portions of the right subclavian artery, and tie the brachiocephalic trunk.

To expose the brachiocephalic artery, the thoracic portion of the primary carotid and left subclavian arteries, and the arch of the aorta, the horizontal incision at the level of the upper edge of the clavicle is continued for about 1 cm. beyond the sternoclavicular articulation of the opposite side. The clavicle is sawed as before and on the inner part of the incision the sternoclavicular articulation of the opposite side from the sectioned clavicle is cut and the flap continued and turned back as previously described. This gives full exposure of the large vascular trunks of the anterior mediastinum.

The foregoing technique is described in detail and illustrated by a number of schematic plates.

Sencert's methods, which were arrived at after experimental trials on cadavers, fulfil the surgical desiderata of giving safe and satisfactory access to the vessels at the base of the neck and affording sufficient light for all types of surgical operations upon them. The danger of the operation which was formerly urged against this type of intervention is therefore much reduced.

Sencert deals also with the indications for operation both in primary wounds of the vessels of the base of the neck and in the secondary and infective



complications which may arise in the course of the evolution of such wounds. The clinical data to a great extent decide whether the operation should be exploratory or according to a definite technique, i. e., clavicular flap or a sternoclavicular flap-exposure of the vessels. In the case of either simple or arteriovenous aneurisms extirpation of the sac is recommended. The author's methods of clavicular section and exposure of the vessels renders such extirpation easy in cases of external aneurism, while the sternoclavicular temporary resection is appropriate for certain internal aneurisms such as those of the primary carotid, brachiocephalic, and other vessels.

Case histories showing the operative advantages of the technique described are given in detail.

W. A. BRENNAN.

**Barthélemy: A New Case of Jugulocarotid Aneurism Treated by Late Ligation and Followed by Hemiplegia** (Nouveau cas d'aneurisme jugulocarotidien traité par la ligation tardive et suivi d'hémiplégie). *Bull. et mém. Soc. de chir. de Par.*, 1919, lxxv, 416.

Barthélemy's patient with a jugulocarotid aneurism was not operated upon until fifty-three days after the injury. The result was unfortunate and not in accordance with the findings reported by Marquis who fixed a limit of twenty days before which, he stated, an operation cannot be undertaken without the possibility of hemiplegia.

This case and a case of hemiplegia after early ligation recently reported by Baudet leads Barthélemy to the following conclusions:

1. Delaying operation for twenty days does not guarantee more favorable conditions for the surgical treatment of aneurisms necessitating the ligation of the primary carotid.

2. It is much more important to remember that, if possible, every operation upon an aneurism of the primary carotid and, more generally, upon a diseased arterial segment should be preceded by a distal preventive ligation, temporary or permanent, below the arterial segment under consideration.

By preventing the migration of clots into the internal carotid, distal ligation diminishes the chances of total thrombosis of the internal carotid which is always a possibility. When the distal preventive ligation is placed below the bifurcation of the carotid, it prevents cerebral complications; when placed in the internal carotid, it lessens the chances of thrombosis of the vessel.

W. A. BRENNAN.

**Duval, P.: The Determination of a Distinct Thrill Over Compressed Vessels in the Absence of an Arteriovenous Communication** (Constatation d'un thrill très net sur des vaisseaux comprimés en l'absence de toute communication artério-veineuse). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 481.

The patient had a pulsating swelling with a distinct thrill which was diagnosed as a right subclavian arteriovenous aneurysm. At operation,

however, the vessels were found to be compressed by a vertebral osteochondroma but intact and without any communication whatever. The patient died shortly afterward and autopsy also demonstrated the absolute integrity of the vessels.

Duval cites several cases reported in recent German war literature in which a similar thrill was perceived after war wounds in the absence of an arteriovenous aneurism. In most of the cases recorded by other authors, however, there was some direct or indirect lesion of the arterial wall.

W. A. BRENNAN.

**Bolognesi, G.: Arteriovenous Aneurism of the Femoral Vessels Due to a War Wound Treated by Extirpation** (Anévrisme artério-veineux des vaisseaux fémoraux par blessure de guerre traité par l'extirpation). *Lyon chirurg.*, 1918-1919, xv, 760.

Clinical and radiological examination showed the presence of an ovoid body in the left thigh in the region of Scarpa's triangle enclosing a large irregular projectile. The diagnosis of an aneurism of the femoral vessels immediately beneath Poupart's space was made and the patient prepared for operation. This preparation lasted for a month and included daily digital progressive compression of the iliac artery to establish collateral circulation sufficient to preserve the vitality of the limb before ligation of the large trunk vessels.

When the preparation was complete the iliac artery and vein were ligated at the upper pole of the aneurismal sac and the femoral artery and vein beneath the lower pole. The aneurismal sac was then completely resected and removed. Except for some hæmorrhage from collateral branches of the ligatured vessels which communicated with the posterior walls of the aneurism, the postoperative course was smooth and without fever. Six months later the patient had completely recovered except that the limb appeared to be somewhat swollen.

W. A. BRENNAN.

## POISONS

**Noronha, A.: Tetanus.** *Indian M. Gaz.*, 1919, liv, 98.

The course taken by the disease depends largely on the following factors: (1) the virulence of the infection; (2) the amount of toxin absorbed by the nervous system; (3) the involvement of the vital centers; and (4) the site and nature of the wound.

Antitetanus serum has been instrumental in reducing hospital mortalities. The dosage recommended is 22,000 units.

If the infection is virulent the toxin may be absorbed from the blood and trismus may be an early symptom. The more complete and the sooner the symptom appears, the more probable that the condition will prove fatal. Lockjaw appears early when the wound is in the region of the fifth nerve.

A sublethal amount of toxin may be kept from increasing by the immediate and repeated injection of antitoxin intravenously. When the vital centers are involved early, the serum has proved of no avail.



The closer the wound to the medulla, the shorter the route by which the toxin reaches the vital centers. Its situation is of no importance, however, when the toxin is poured into the blood to make a lethal dose before it reaches higher up, by the nerve route. Deficient separation and insufficient cleaning reduce the chance of recovery. Carbolic acid often controls spasms when the serum does not, but has not been used independently.

Weakness of the toxin or increased resistance of the patient may result in a longer incubation period. Tetanus toxin consists of tetano-spasmin and tetanolysin which occur together. F. P. HAMMOND.

## SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Parturier: On the Clinical Diagnosis of Pain Syndromes in the Gall-Bladder** (Note sur le diagnostic clinique des syndromes douloureux de la région vésiculaire). *Rev. de chir.*, Par., 1918, lv, 70.

The author calls attention to the difficulties of clinically interpreting gall-bladder and pyloro-duodenal syndromes. A differential diagnosis is often clinically impossible. In this doubtful condition he believes that the sign of painful inspiration is of value. Up to the present time this sign has permitted him to make an accurate diagnosis in five instances, including cases of duodenal ulcer.

The sign of painful inspiration is found in the following manner: with the patient lying down and in a state of as complete muscular relaxation as possible, the examining finger is placed perpendicularly into the gall-bladder region and pushed into the region of the bladder until pain is felt. At this moment the patient is asked to make a strong inspiration. If the pain becomes more severe, the condition is probably vesicular, while if it remains unchanged, it is probably duodenal. The particular portion of the duodenum affected can be localized by methods of palpation which are described. W. A. BRENNAN.

**Bloodgood, J. C.: Bone Tumors. Central (Medullary) Giant-Cell Tumor (Sarcoma) of Lower End of the Ulna.** *Ann. Surg.*, 1919, lxix, 345.

This article is a continuation of two others which appeared several years ago in the *Annals of Surgery*. The first included a full bibliography on bone cysts and multiple bone lesions.

Since his last article, the author has re-investigated 47 cases of giant-cell tumor then reported and has found that the malignancy of these tumors is not increased when the bone shell is perforated or even completely destroyed. In almost all of these cases the ultimate results are known and there have been no deaths from metastasis.

The bones involved were the radius, lower end, 13; tibia, 11; femur, 10; fibula and ulna, 3; astragalus and os calcis, 2; ilium, clavicle, and phalanx of toe, each 1.

The author states that the more he studies this

group of local growths the more he is convinced that they belong to a special type of angioma or granulation-tissue tumor of which the xanthoma is a variety. The typical giant-cell tumors are observed on the alveolar border of the jaw and are usually called epulis. In the latter the etiological factor seems to be granulation tissue from infection about a tooth or its root cavity. The majority of tumors about the tendon sheaths contain giant cells and the stroma is not unlike the central giant-cell tumor of bone. The same type of giant-cell tumor, except much more vascular, is now and then observed in bursae and joints.

In the so-called xanthoma characterized by the presence of foam cells, giant cells of the type seen in the central giant-cell tumor of bone are either absent or present in only small numbers. But in all of these tumors containing giant cells, vascularity is a characteristic feature. The epulis bleeds when injured and if the central giant-cell tumor of bone is explored without the use of an Esmarch bandage, it bleeds profusely. In all of these so-called giant-cell tumors death from metastasis was conspicuous by its absence in the cases studied by the author while in all forms of cellular sarcoma death from metastases to the lungs is frequent.

Bloodgood suggests that bone aneurisms be called "malignant bone cysts" in order to contrast them with benign bone cysts which do not contain blood. Occasionally one of the giant-cell tumors appears as a hæmorrhagic bone cyst, resembling a malignant bone cyst, as in one of the cases cited. Malignant bone cysts, or bone aneurisms, are composed chiefly of round or spindle cells and recur even after amputation, death invariably resulting from metastasis. The giant-cell tumor resembles oedematous granulation tissue and bleeds readily when curetted, at times making the use of an Esmarch bandage necessary. Hæmorrhage into these tumors, however, is not the rule.

Hinds, of England, was the first to curette a very large giant-cell tumor. In this case the growth occurred in the lower end of the femur.

From the author's experience it seems quite evident that there is no risk in performing a local operation even when the bone shell has been perforated. Curettage is the operation of choice and will restore perfect function unless there is complete destruction of the bone. In this event, bone transplantation may be necessary. In cases of local recurrence, a second curettage may be done without fear of metastasis. The author feels confident that if surgeons learn to recognize the central giant-cell tumor, a great deal of unnecessary mutilation may be avoided. GATEWOOD.

**Jean, G.: Cancer of the Serous Membranes** (Cancer des séreuses). *Arch. de méd. et pharm. nav.*, 1919, cvii, 305.

When in the course of a laparotomy small white spots are observed disseminated in the peritoneum, omentum, mesentery, renal capsules, etc., an affec-



tion of the pancreas is usually suspected. In some instances, however, exploration of the pancreatic region may reveal nothing abnormal.

Jean reports two cases of cancer of the serous membranes in which such spots were observed but at autopsy the pancreas was found intact. In one case they were due to a secondary alveolar epithelioma and in the other to generalized sarcoma. He therefore warns surgeons against a possible error in diagnosis arising from this finding.

W. A. BRENNAN.

**Thompson, R. L.: Note on the Prevalence of Syphilis as Found in Routine Coroner's Autopsies.** *Am. J. Syphilis*, 1919, iii, 196.

In 700 routine autopsies, about two-thirds of the bodies of adults showed the gross lesions of syphilis. The majority of these belonged to people of the underworld.

In another series of autopsies, one-third of the bodies of adults showed syphilis. In the lesions of acquired tertiary syphilis, gummata were found infrequently, but in some cases healed scars, the result of gummata, were present. Luetic cirrhosis of the liver was common. Lesions of the kidney, lung, stomach, and intestine were uncommon. Most numerous were lesions of the nervous and cardiovascular systems.

I. E. BISHKOW.

**Sollmann, T.: Dichloramine-T and Petrolatum Dressing for Burns.** *J. Am. M. Ass.*, 1919, lxxii, 992.

Dichloramine-T as a wound antiseptic furnishes a continuous supply of antiseptic agent and secures continuous action over long periods of time with the simplest forms of dressings. However, it must be prepared with care and when used must be fairly fresh.

Dichloramine-T-chlorcosane solution is absorbed by dressings and glued to the wound so that pain is produced when the dressing is removed. At the ulcerative stage petrolatum is used, but this furnishes protection to the bacteria as well as the tissue. Solid paraffin prevents contact of the antiseptic with the wound. Good contact is secured with liquids and semiliquids.

An ointment of 3 parts surgical paraffin and 7 parts liquid petrolatum has relatively little destructive action on dichloramine-T and can be applied as a protective dressing to wounds (burns) which have been treated with dichloramine-T-chlorcosane solution and even as a base for dichloramine-T ointment.

Petrolatum, irrespective of its color, is very destructive to dichloramine-T and cannot be used effectively with it. In emergencies, liquid petrolatum is of value as a vehicle for dichloramine-T although it is inferior to chlorcosane. Solutions of dichloramine-T in carbon tetrachloride are very stable, while those in kerosene or olive oil deteriorate very rapidly.

F. P. HAMMOND.

## EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Carmona, A. H.: Periosteal Ossification** (Nuevas orientaciones sobre la osificación periosteal). *Prog. de la clin.*, 1919, vii, 129.

The author sums up the results of bone-graft experiments on dogs as follows:

1. Simple periosteal grafts in dogs gave positive results as regards the taking of the graft. This was fully substantiated by microscopic examination of the grafts removed from the animals after the elapse of sufficient time.

2. Simple bone grafts gave negative results. Several experimental results showed that bone separated from its periosteum is impotent as regards regeneration.

3. Surgical bone grafts should always include the periosteum.

W. A. BRENNAN.

**Mayer, L.: Further Studies in Osteogenesis.** *Ann. Surg.*, 1919, lxix, 360.

Despite the intensive study of bone growth stimulated by Macewen's monograph, our knowledge of the exact changes which occur in the autogenous bone graft subsequent to transplantation is in many respects imperfect. Macewen maintains that osteogenetic activity arises in the bone cells, that osteoblasts pour out of the bone subsequent to injury or transplantation, and that the periosteum acts merely as a limiting membrane. According to the opposite view, which dates from the research of Ollier and emphasizes the importance of the periosteum, the bone cells die, and regeneration occurs through the activity of the transplanted periosteum and the adjacent bone.

The author reports the condition of two specimens which he obtained at autopsy from the bodies of patients upon whom he had previously performed an Albee operation for Pott's disease. Careful study of these specimens shows rather conclusively that the fully developed bone cell has no power of division and that bone growth results from the activity of cells lying between the bone and the outer layer of the periosteum, the so-called cambium layer of the periosteum. In transplantations, therefore, the bone graft acts partly as a scaffolding for the ingrowth of osteogenetic cells, its own life being maintained by the persistence of some of its bone cells and the activity of the transplanted periosteum. The graft grows in its new situation and becomes modified in its form according to the changed mechanical conditions (Wolf's law).

GATEWOOD.

**Levick, G. M.: The Adjustment of Response to Nerve Stimulus in Voluntary Muscles.** *Brit. M. J.*, 1919, i, 369.

This paper is based on the results of tests made in the electricity departments of two of the largest military orthopedic hospitals upon many hundreds of men wounded in the present war. These patients had been treated for every grade of nerve injury,



ranging from slight shock or compression to complete division. The nerves were sutured in the operating theaters, and their subsequent regeneration and the reaction of the muscles they supplied were observed through all the stages of recovery, as was also the oncoming of compression from the formation of fibrous tissue in healing wounds with all its resulting effects upon the response of the muscles to various forms of stimulus.

The observations here recorded were made by means of an apparatus the essentials of which were a transmitting rod which rested upon the skin over the muscle observed and was attached to a tambour connected with a pen which traced its movements upon a revolving drum. In this way it was possible to record the character of each muscle contraction with accuracy.

The electrical stimulus used was the closure of the circuit of a galvanic current by a metronome interrupter with mercury make and break. This gives a stimulus of indefinite duration.

As a rule both electrodes were placed over the muscle. When the contraction of a muscle was equal to that of the corresponding muscle on the opposite and uninjured side it was considered normal. In all cases the metronome was timed to interrupt sixty times a minute so that, when desired, the resulting contraction could be expressed in fractions of a second.

In the records the author has shown that after injury to a motor nerve the muscles supplied by the injured fibers respond to stimulus with a contraction longer in duration than that of normal muscle. This was observed in every one of the many hundred cases tested. It appears that this lengthening of the contraction is due to hyperexcitability in the muscle following a definite sequence of events, though there is also an alternative conclusion which at present is under investigation.

It is a matter of common knowledge that when for some pathological reason the stimulus from the upper motor neurone weakens or ceases, the anterior horn cells of the lower neurone become hyperexcitable and the muscle tone is increased.

In health, proper response of the lower neurones to the stimuli passed down from above must be due to a delicate adjustment between the irritability of the upper and lower neurones.

For this reason it is a natural sequence for the lower neurone to become hyperexcitable when for any reason the upper stimuli become less intense, and it is known that when there is impairment of the upper neurone this hyperexcitability is increased to a pathological degree, as shown in the exaggerated reflexes in such cases as cerebral tumor, certain injuries of the cord, etc.

From the facts given the author draws the following conclusions:

1. A muscle undergoing a succession of stimuli of varying strength responds with a succession of contractions which are of varying intensity but of equal duration.

2. The duration of the contraction of a muscle is the same whether it occurs in response to a short, sharp stimulus or to a long, diffuse stimulus.

3. When the conductivity of a motor nerve is slightly reduced, the duration of response in the muscle it supplies is slightly lengthened.

4. When the conductivity of a motor nerve is much reduced or entirely destroyed, the duration of response in the muscle is much lengthened.

5. When the stimulus from a motor nerve is abnormally and persistently increased, the duration of the response in the muscle supplied by it is shortened.

G. E. BEILBY.

**Nasseti, F.: Parietal Ligament of the Stomach and Intestine** (La legatura parietale dello stomaco e dell' intestino). *Sperimentale*, 1919, lxxii, 227.

By parietal ligation of the stomach and intestine the author means the application of a constricting band at the base of an inverted or everted fold of the wall of the organ.

The author's experimental investigation had as its object the determination of the anatomo-pathologic consequences of such ligation. In his experiments he worked upon the small and large intestines and the stomachs of dogs and rabbits. The folds ligated comprised the entire thickness of the wall or only one or two coats. To form the inverted fold a gastrotomy was first performed and a part of the wall ligated after it was drawn through the opening. The tying was done with catgut or silk. The animals were fasted before and after the operation and were killed at periods varying from five to one hundred and forty-eight days.

Eighteen experiments were carried out. The principal findings were that when the whole thickness of the wall was included, a cicatrix was always formed at the spot where the fold was ligated. Also observed was a break in the muscular coat. The more or less thick and extensive cicatrix which repaired this break completely re-established the continuity of the wall and had its origin in the newly formed connective tissue which was produced about the site of the ligation. Particularly noteworthy was the absence of perforation. The author rather expected that the ligated part would rapidly become necrotic and detached, but this did not occur.

When in these experiments an inverted fold became necrotic a fibrinous exudate on the corresponding peritoneal surfaces made the zone of wall operated upon adherent to the neighboring organs and set up protective adhesions. In this protective action the omentum was of particular importance. When the area of wall ligated became detached, the solution of continuity was overcome by granulation tissue and regeneration began.

In an everted fold the evolution of the scar process was somewhat different. Soon after total ligation, epithelial and muscular degeneration



of the part was found. The circulation around the neck of the fold was quickly re-established, however, and this explains why the fold did not become necrotic. The continuity of the wall was restored by cicatricial tissue.

When silk was employed as ligature material a fistula persisted at the site from which it was ultimately eliminated.

A finding of particular interest was the presence in some of the scar nodules of epithelial masses in the course of degeneration. The quantity of such elements and their character demonstrated that they originated in a proliferation of the epithelial elements of the mucosa.

In the depths of the cicatrix were seen accumulations of vegetal elements surrounded by and interspersed with newly formed connective tissue. This gives a clue to the manner in which such formations occur about gastric or intestinal material of vegetal nature which may enter the peritoneum through an ulceration.

The article is illustrated with a number of excellent plates.

W. A. BRENNAN.

**Jona, J. L.: A Further Contribution to the Experimental Study of Duodenal Ulcer.** *M. J. Australia*, 1919, i, 314.

In a former article the author showed that the injection of extracts of decomposing animal tissues subcutaneously gave rise to a condition comparable to duodenal ulcer. In addition, there was an inhibiting influence on the secretion of saliva and pancreatic juice. These experiments were undertaken to test the contention that inhibition of the normal flow of pancreatic juice is a factor in the etiology of duodenal ulcer.

The main pancreatic ducts in dogs were tied or doubly tied and cut between the ligatures. The dogs were then anesthetized to death and a post-mortem examination made. A lesion was found in the duodenum resembling duodenal ulcer.

On the basis of the results of these experiments the author gave a number of his patients secretin by mouth. This was taken about one-half hour before meals so as to avoid the action of the hydrochloric acid which destroys it. The results obtained were very gratifying. In addition to the administration of secretin, attention was paid to correcting constipation, the repair of carious teeth, and the removal of infected tonsils.

I. E. BISHKOW.

**Donaldson, R.: Character and Properties of the "Reading" Bacillus on Which a New Method of Treatment of Wounds Has Been Based.** *J. Path. & Bacteriol.*, 1918, xxii, 129.

This article is a résumé of research work on which has been based a new method of treatment of septic gunshot wounds. The main outlines of this method have already been published. (Donaldson and Joyce: *Lancet*, 1917, ii, 445.)

The idea gradually took shape in the author's

mind during an investigation which was the result of a clinical observation made by one of his surgical colleagues, Major Joyce.

The results obtained by Joyce with the salt-pack method of treating septic gunshot wounds were on the whole excellent and tallied with those of others who had previously employed the method. In one or two cases, however, this treatment proved a failure. For a time there was no explanation forthcoming until Major Joyce observed that while all wounds treated successfully by the salt-bag method emitted a characteristic foul, pungent odor, this odor was completely absent where the treatment failed. On being informed of this observation, the obvious explanation occurred to the author that an organism or organisms were present in the one type of case, but absent in the other. Judging from the odor of successfully treated wounds, it was concluded that the organism to be looked for probably belonged to the anaerobic group.

Cultures were first made in cooked meat from a successful salt-bag case and grown anaerobically, with the result that two anaerobes growing in symbiosis were obtained. Both were spore-bearers, but while one possessed round terminal spores, those of the other were oval and subterminal.

Each of the two anaerobes was then isolated in pure culture. Only one of them emitted any odor, and this was exactly similar to the odor peculiar to successful salt-bag cases. The organism responsible was the bacillus with the oval subterminal spore which has been named by the author the "Reading" bacillus.

From its behavior in wounds and animal experiments, this bacillus, like most spore-bearing anaerobes, is a saprophyte. In the author's opinion, it is probably present in the majority of gunshot wounds, but its activities are held in abeyance by the system of wound dressing usually adopted.

The Reading bacillus most closely resembles *B. sporogenes* (Metchnikoff) from which, however, it differs in certain points. Perhaps it would be correct to say that it is probably one particular strain in what may be called the *sporogenes* group.

Experiments show that it is non-pathogenic for animals as well as for man when introduced into septic wounds. It does not attack living tissues. The cell response of tissues to the introduction of the bacillus has been investigated.

Salt is not necessary for the successful treatment of gunshot wounds as was thought by those who advocated the salt-bag method, the favorable outcome depending rather upon the activity of the bacillus described under conditions favorable to its growth.

The rationale of the method does not depend on inhibition by the Reading bacillus of the growth of pathogenic organisms in the wound, either by the formation of any inhibitory organic acid or the production of a bacteriolytic ferment. This was shown by symbiotic experiments.

By virtue of its proteoclastic enzymes, however,



the Reading bacillus acts as an organic catalyst which hydrolyzes the substrate of dead protein. It disintegrates the protein base from which pathogenic organisms operate and while so doing does not itself give rise to fresh toxic substances.

It is probably able also to hydrolyze the toxic degradation products of other organisms. In support of this, experiments on tetanus and other toxins show that in a series of organisms investigated the Reading bacillus was alone able to reduce the toxicity of these toxins. There is one exception, i.e., *B. sporogenes* (Metchnikoff) which, however, does not appear to be so potent in this direction. The ability to disintegrate necrotic tissue does not necessarily imply an equal power to hydrolyze toxins, as is illustrated by the experiments with *B. histolyticus*, which may be highly useful for museum work but would probably be dangerous in wounds.

The ability to modify a toxin like that of tetanus may prove to be of value as a means of differentiating various types of proteolytic organisms and introduces new ideas in regard to the biological processes going on in septic gunshot wounds.

To treat a septic wound successfully involves a knowledge of how and what toxins are produced by the pathogenic organisms present. The crude attempt to sterilize a wound by endeavoring to kill off the organisms by the simple application of antiseptics must in time give way to a method based on a more intimate knowledge of the biological processes at work. Too much time has already been wasted in what appears to be a vain endeavor to find an ideal antiseptic.

The new method described, which the author calls the biological method, is a step in this direction, and is intimately bound up with questions of colloid chemistry, further work on which may lead to other important developments. G. E. BEILBY.

**Malone, R. H., and Rhea, L. J.:** Studies on Streptococci Recovered from Sick and Wounded Soldiers in France. *J. Path. & Bacteriol.*, 1918, xxii, 210.

It is well known that streptococci differ in their pathogenic properties, morphologic characters, and cultural reactions and that they form a group of organisms the members of which vary among themselves and in this way resemble other groups of bacteria, for example, the typhoid-colon group. Some of them bear more than a casual relation to certain diseases and so frequently occur in them that some writers appear to believe that they are almost as specific in these conditions as *B. typhosus* is in typhoid fever. Acute rheumatic fever is one example.

Streptococci vary considerably in virulence. An appreciation of this fact must influence any conception of the future course, immediate and remote, of diseases due to, or complicated by, these organisms, for the prognosis depends not only upon the treatment and the factors concerned in immunity in the broad sense, but also upon the nature of the infecting organism.

The earlier classifications of streptococci were based upon their pathogenic properties and morphologic characters such as variation in the length of the chains and the size, shape, and arrangement of the cocci forming a chain. From such classifications as these the names *streptococcus longus*, *brevis*, *pyogenes*, *mitior*, etc., were derived. The pathogenicity of the various types is so little understood and the morphology so inconstant, however, that classifications based on these characters alone are necessarily incomplete and even apt to be misleading.

The factors concerned in the production of the hæmolytic zone are not fully understood. The phenomenon has been said to depend upon the action of a hæmolysin, but of this not much is known, nor is it understood how the freed hæmoglobin and the bodies of the red cells are disposed of. It seems reasonable to assume that they are not merely destroyed, but are utilized in the metabolism of the body.

The majority of the non-hæmolytic strains produce colonies of various shades of brown or green such as are formed often on blood agar containing 1 per cent glucose. The pigmentation is due to methæmoglobin, but how it is produced is not known. It has been suggested that it is formed from hæmoglobin by the action of acids derived from the carbohydrates in the media. This seems improbable, as streptococci grown in dextrose ascites bouillon to which sheep's corpuscles have been added produce methæmoglobin very readily even when the neutrality of the medium is maintained by the addition of secondary phosphates.

During the past year a study has been made of the streptococci isolated from various types of wounds and the relation of this group of organisms in general and to their surgical complications.

The work was undertaken primarily with the hope that it might assist the surgeon in forming an opinion with regard to the proper surgical procedure, subsequent treatment, and prognosis in cases of streptococcal infection, for all of these depend in some degree upon the particular type of the infecting organism.

For this report 25 of the cases studied have been selected for analysis. In these the lesions studied were indirectly connected with the track of the missile and the exterior or contained streptococci in pure or nearly pure culture. Such indirect connection is seen, for example, in a shrapnel wound of the leg when there is only bloody effusion in the knee-joint and no fracture into the joint itself or laceration of the capsule. The abscesses included in this report developed at such a time after the primary injury, or bore such a relation to it, as to warrant the conclusion that they were secondary infections. In other cases, streptococci were recovered in pure, or nearly pure, culture, from closed wounds such as those in thoracic injuries.

By this selection of cases it was hoped to determine the type or types of streptococci which cause surgical complications in wounds other than those



found in the track of the missile, its lining, or the tissues immediately about it. It was further hoped to find streptococci in pure, or nearly pure, culture, or in such numbers that it would seem probable that they were the cause of the lesion. This would be difficult in cultures made from the track of the wound soon after injury.

The classification adopted is that suggested by W. L. Holman, and while no brief is held for the nomenclature employed, it is comprehensive enough to include over 2,400 strains of streptococci, 50 per cent of which are hæmolytic.

Hæmolytic Strains	Lac-tose	Man-nite	Sal-i-cine	Non-Hæmolytic Strains
S.infrequens	+	+	+	S.fæcalis
S.hæmolyticus (i)	+	+	+	S.non-hæmolyticus (i)
S.pyogenes	+	—	+	S.mitus
S.anginosus	+	—	—	S.salivarius
S.hæmolyticus (ii)		+	+	S.non-hæmolyticus (ii)
S.hæmolyticus(iii)		+		S.non-hæmolyticus (iii)
S.equi	—	—	+	S.equinus
S.subacidus	—	—	—	S.signavus

The plus signs in the table indicate fermentation with acid production, and the minus signs the absence of fermentation.

G. E. BEILBY.

**Sellards, A. W., and Wentworth, J. A.: Insusceptibility of Monkeys to Inoculation with Blood from Measles Patients.** *Bull. Johns Hopkins Hosp.*, 1919, xxx, 57.

The authors here review the results of their study of the problem of prophylactic inoculation against measles. Unfortunately, the causative organism of the disease is not known. While a variety of bacteria has been cultivated from the blood and the mucous exudates, evidence of the etiological importance of these organisms has not been produced. However, it has generally been considered that by inoculation into man Hektoen established the existence of the virus of measles in the blood at least during the first day after the rash appears. Four groups of workers have reported on very slight evidence that monkeys are susceptible to the disease. These meager data constitute the essential results of the experimental work which has been conducted on measles.

In the experiments reported in this article, monkeys were inoculated with blood obtained from measles patients 20 to 30 years of age. In all cases the blood was withdrawn within the first twenty-four hours after the appearance of the rash and either defibrinated or collected in sodium citrate solution prepared in physiological saline.

Observations were made on the inoculated animals each day about the middle of the forenoon, especial attention being given to the body temperature and the leucocyte count. The room temperature was also recorded because under normal con-

ditions the temperatures of monkeys fluctuate somewhat. The buccal mucous membranes were examined from time to time for the appearance of Koplik spots. Excellent housing conditions were available for the animals, all difficulty from the spontaneous development of rhinitis or coryza during the incubation period being thus prevented.

The authors summarize the article as follows:

1. Three monkeys were inoculated with the blood of measles patients taken early in the course of the disease in moderately severe cases. These animals remained entirely free from any symptoms that were either diagnostic or even suggestive of measles. Two of them which were given injections a second time also failed to develop symptoms.

2. After an incubation period of eleven days, blood was taken from one of these monkeys and injected into a human volunteer. No symptoms developed.

G. E. BEILBY.

### ROENTGENOLOGY AND RADIUM THERAPY

**Lockwood, I. H.: A Brief Résumé of the X-Ray Work in an Evacuation Hospital.** *Mil. Surgeon.*, 1919, xlv, 393.

Conditions in an evacuation hospital are such that speed and accuracy, combined with simplicity and all possible comfort to the patient, are prime considerations as regards military roentgenology. In the localization of foreign bodies, which comprises a large part of the work in a hospital of this kind, the localization should be made with the patient in the same anatomical position that the surgeon would place him while operating. The report should be short and concise and state the depth and size of the body and the anatomical position of the part when the localization was made. The methods used were: the 26° 34"; Strohl; near-point; Hirtz compass; and the single tube shift methods, the last more extensively than the others.

Lists are given of the total number of cases examined and their nature; the relative frequency of foreign bodies in the various soft parts, bones and cavities; cases of fracture and the bones involved; chest examinations and the pathologic findings. There was a marked predominance of foreign bodies in the extremities.

The roentgen examination has been of great assistance also in the early diagnosis of gas gangrene before the appearance of the cardinal symptoms.

ADOLPH HARTUNG.

**Stevenson, W. C.: Lecture on the Technique of the After-Treatment of War Injuries by Radium.** *Arch. Radiol. & Electrotherapy*, 1919, xxiii, 356.

The treatment of an extensive scar on the wrist with radium emanation needles having resulted in marked improvement, the author was led to apply similar methods to about 300 military patients afflicted with adherent or painful scars or stiff joints resulting from tenosynovitis. In the vast majority of the cases thus treated a greater or less degree



of improvement was apparent, sufficient to recommend the procedure as a method worthy of recognition.

The article embodies a short account of radium, the rationale of treatment, and the dosage employed. The physical effect of radium treatment in moderate doses on normal cells and tissues was found to be: increased metabolism of the cells; improved nutrition of the parts; stimulation of the nerves and muscles to perform normal functions; the absorption and freeing of scar tissue; the softening of fibrous adhesions due to sepsis and disuse in synovitis and tenosynovitis; and analgesia.

Skin with trophic changes due to nerve involvement was found very susceptible to radium burns. Small doses frequently repeated produced as good results as larger doses except when there was extensive and deep scarring. ADOLPH HARTUNG.

**Hall, C. C., and Whipple, G. H.: Roentgen-Ray Intoxication: Disturbances in Metabolism Produced by Deep Massive Doses of the Hard Roentgen Rays.** *Am. J. M. Sc.*, 1919, clvii, 453.

This article is an exhaustive study of the constitutional effects of prolonged exposure to roentgen rays from the Coolidge tube. It is based on experiments made upon dogs with special reference to nitrogen elimination and checked up by autopsy findings. The purpose was to determine, as far as possible, the cause of the systemic reaction to radiation. Various theories advanced by others are mentioned and attention is called to the fact that some of these are untenable and have not been substantiated by proof.

Detailed accounts of the manner in which the experiments were conducted are given and the results carefully tabulated. Lethal and sublethal doses were administered with filters to prevent burns; likewise, exposures without filters, which caused skin reactions, and exposures after chloroform anesthesia. The various effects produced are discussed at length and the results summarized in the following conclusions:

"The general constitutional reaction of dogs given a lethal dose of hard roentgen rays from the Coolidge tube is remarkably uniform and constant. A double lethal dose will not modify the clinical reaction. A latent period of twenty-four hours or longer is the rule and during this time the dog is normal except for an excreted urinary nitrogen. Vomiting and diarrhoea then dominate the clinical picture until death, which as a rule follows on the fourth day.

"The blood non-protein nitrogen commonly shows a marked increase (twice normal) on the day before death and often more than three times normal on the day of death.

"The elimination of urinary nitrogen is increased on the day following the roentgen-ray exposure and remains high until death, often an increase of 50 to 100 per cent above the normal base line.

"Autopsy findings are: a spleen which is small and

fibrous, a moderate grade of congestion and mottling of the intestinal mucous membrane and strong evidence for epithelial injury in the intestinal mucosa. The epithelium lining the intestinal crypts may show actual necrosis and invasion of polymorphonuclear leucocytes. This epithelium also shows remarkable speed of autolysis and may vanish by autodigestion within a few hours postmortem.

"The epithelium of the small intestine apparently is sensitive to large doses of the roentgen-rays, and the injury of these important cells may furnish the correct explanation of the general intoxication associated with the vomiting and diarrhoea.

"The so-called roentgen ray anaphylaxis or hypersensitiveness to a second properly timed roentgen-ray exposure finds no support in our experiments. In fact, there is some evidence for a slightly increased tolerance to the second dose.

"Chloroform injury and the associated liver necrosis do not modify the reaction of the dog to large or small doses of the roentgen rays. This is evidence that the liver epithelium is not fundamentally involved in the fatal roentgen-ray intoxication.

"Our experiments yield no evidence of roentgen-ray nephritis.

"Increasing the width of the spark gap increases the hardness or penetration of the roentgen rays, and this greatly increases the severity of the constitutional reaction and subsequent intoxication.

"Burns caused by the roentgen rays are not associated with any distinct increase in urinary nitrogen during the long latent period between the roentgen-ray exposure and the early dermatitis which precedes the actual ulcer. We know of no satisfactory explanation for this long latent period, which may last for three weeks.

"This roentgen-ray intoxication or general constitutional reaction is a good example of a 'non-specific' intoxication. Much important information can be obtained by further study of this condition and will well repay the effort."

An extensive bibliography is appended.

ADOLPH HARTUNG.

## INDUSTRIAL SURGERY

**Scheffell, C.: An Analysis of Two Hundred and Sixteen Industrial Accidents.** *Med. Rec.*, 1919, cxv, 685.

A plant employing males and females from 16 to 60 years of age, with all protection against accidents, had an average of 26 accidents due to negligence of fellow employees, 19 due to unavoidable causes, and 111 traceable to carelessness.

More accidents seemed to occur between 8 and 9 o'clock in the morning and 1 and 2 o'clock in the afternoon or during the "warming up" time. The greater number occurred also in September and October rather than, as is generally believed, in the hot months.

The parts of the body injured most frequently were the right index and middle fingers. Next in



number were injuries to the palm of the hand, the latter being more susceptible to sepsis.

The new employe was the victim of more accidents than the old employe and the greatest number of accidents occurred during his first three months of service.

F. P. HAMMOND.

**Carr, I. E.: Two Thousand Seven Hundred and Sixty-Two Industrial Accident Cases Classified. *J. Michigan M. Soc.*, 1919, xviii, 156.**

The following classification represents all injuries ranging from trivial abrasions to serious crushing injuries which occurred during a given period in several of the large Lansing factories engaged in the manufacture of engines, automobiles, and automobile parts:

**I. ANATOMICAL CLASSIFICATION**

Hands and fingers..	1,303	Legs.....	150
Feet.....	241	Eyes.....	532
Head.....	134	Gas suffocation....	3
Trunk.....	207	Electrocution.....	1
Arms.....	191		2,762

**II. DIAGNOSTIC CLASSIFICATION**

Fractures.....	108	Bruises.....	208
Contusions, lacerations, cuts, and abrasions.....	919	Puncture wounds...	154
Amputations.....	52	Strains.....	130
Dislocations.....	8	Foreign bodies.....	528
Infections.....	414	Hernia.....	20
Burns.....	158	Suffocation.....	3
Sprains.....	59	Electrocution.....	1
			2,762

**III. ANATOMICAL CLASSIFICATION DISTRIBUTED**

*Hands and Fingers*

Fractures.....	28	Burns.....	32
Lacerations, contusions, cuts and abrasions.....	660	Sprains.....	10
Amputations.....	44	Bruises.....	113
Dislocations.....	3	Punctures.....	60
Infections.....	338	Strains.....	2
		Foreign bodies.....	13
			1,303

*Feet*

Fractures.....	17	Sprains.....	2
Lacerations.....	50	Bruises.....	36
Amputations.....	4	Punctures.....	68
Infections.....	28		241
Burns.....	36		

*Head*

Fractures.....	7	Burns.....	21
Cuts.....	81	Bruises.....	15
Infections.....	10		134

*Trunk*

Fractures.....	17	Bruises.....	13
Abrasions.....	16	Punctures.....	3
Dislocations.....	5	Strains.....	117
Infections.....	2	Foreign bodies.....	1
Burns.....	7	Hernia.....	20
Sprains.....	6		207

*Arms*

Fractures.....	17	Sprains.....	17
Lacerations, abrasions, and cuts...	81	Bruises.....	9
Amputations.....	2	Punctures.....	6
Infections.....	25	Strains.....	9
Burns.....	24	Foreign bodies.....	1
			191

*Legs*

Fractures.....	22	Bruises.....	22
Contusions.....	31	Punctures.....	16
Amputations.....	2	Strains.....	2
Infections.....	11	Foreign bodies.....	7
Burns.....	13		150
Sprains.....	24		

*Eyes*

Burns.....	25	Foreign bodies.....	506
Punctures.....	1		532

**IV. DIAGNOSTIC CLASSIFICATION DISTRIBUTED**

*Fractures*

Legs.....	22	Fingers.....	28
Trunk.....	17	Arms and forearms...	17
Head.....	7		108
Feet.....	17		

*Amputations*

Legs.....	2	2 fingers.....	11
Arms.....	2	3 fingers.....	4
Toes.....	4	4 fingers.....	1
Thumb.....	7		52
1 finger.....	21		

*Infections*

Toes.....	28	Head.....	10
Fingers.....	338	Trunk.....	2
Arms.....	25		414
Legs.....	11		

*Sprains*

Arms.....	17	Feet.....	2
Legs.....	24	Trunk.....	6
Hands.....	10		59

*Puncture Wounds*

Arms.....	6	Trunk.....	3
Feet.....	68	Eye.....	1
Hands.....	60		154
Legs.....	16		

*Contusions, Lacerations, Cuts, and Abrasions*

Legs.....	31	Fingers.....	660
Trunk.....	16	Arms.....	81
Head.....	81		919
Feet.....	50		

*Dislocations*

Shoulders.....	5	Fingers.....	3
			8

*Burns*

Trunk.....	7	Head.....	21
Legs.....	13	Arms.....	24
Feet.....	36	Eye.....	25
Hands.....	32		158

<i>Bruises</i>			
Hands.....	113	Arms.....	9
Feet.....	36	Head.....	15
Legs.....	22		208
Trunk.....	13		
<i>Strains</i>			
Hands.....	2	Legs.....	2
Trunk.....	117		130
Arms.....	9		
<i>Foreign Bodies</i>			
Eyes.....	506	Trunk.....	1
Hands.....	13	Arm.....	1
Legs.....	7		528

### MILITARY SURGERY

**Robin, E.: Extraction of Metallic Foreign Bodies.**  
*U. S. Nav. M. Bull.*, 1919, xiii, 237.

This article deals with a rapid, accurate, and harmless method of extracting foreign bodies with forceps under the direct control of the fluoroscopic screen which was developed by LeConiac and Corolleur, radiographers at the Hospital Principal de la Marine of Brest. In view of its simplicity, the method is applicable to most cases. The author emphasizes that any foreign body, no matter how small and apparently innocuous, should be removed after it has been anatomically localized. Both radiographer and surgeon must know anatomical topography. The anatomical localization is obtained by studying the respective displacements of the foreign body on the one part and of the organs of the neighborhood, chiefly bones, on the other part, while the body is being rotated from one side to the other. This rotation is highly serviceable. Extraction under the direct control of the X-ray with forceps passed through a small buttonhole opening in the skin, is most rapid, practical, and safe.

The author has removed more than one thousand foreign bodies in the manner described and has never damaged a nerve or a blood vessel of importance. Eight or ten foreign bodies of the extremities at different depths can be removed in half an hour, this time including sterilization of the skin in different areas. Usually 5 cc. of ethyl-chloride will induce sufficient anæsthesia for the removal of a foreign body from the thigh or from the leg at any depth. For a description of the numerous steps in the operation, the reader is referred to the original article.

This method of extraction is simple and very rapid when the surgeon has acquired a little experience. In the soft parts it may be undertaken with safety by any surgeon. A slight modification of technique permits the removal of foreign bodies from bones (with a curette after trephining the bone) and from the brain (after craniotomy and opening of the meninges).

The method of extracting foreign bodies from the lungs is the same as for all foreign bodies, except that the technique is somewhat modified and must appeal to every surgeon because it is simple, rapid, and

safe. On the basis of experience with over two hundred cases, it is recommended as the method of election, infinitely preferable to extractions after pleurotomies with or without rib resection. However, it must be borne in mind (1) that though all other parts of the lungs are accessible, the region of the hilum must not be operated by this method, and (2) that before operating upon a lung the surgeon should have experience in removing foreign bodies from the soft parts of the limbs. The author has extracted fifty foreign bodies from the thorax with perfect results and no deaths. It is noteworthy that after two years of intensive radio-surgery, the skin of his hands is perfectly normal.

F. ROBBINS.

**Pybus, F. C., Slade, H. J., and Laws, P. C. W.: Note on the Variety and Latency of Organisms on Missiles in the Tissues.** *Brit. M. J.*, 1919, i, 481.

It is a well-known fact that organisms may remain latent in certain tissues of the body and at a later date "flare up" and cause acute symptoms.

The authors had systematic bacteriological examinations made of missiles which were apparently sterile or at least gave no clinical indication of infection at the time of their removal from the tissues.

These missiles were removed with the usual surgical precautions and dropped into sterile tubes. In some cases they were shelled out of the fibrous capsule in which they were lodged. In others they were extracted in the capsule, which latter was removed before the cultures were made.

The reason for the removal of the missiles was either that they caused pressure upon nerves or interfered with movements. The length of time they had remained in the tissues varied from one to thirty months.

The results obtained were as follows:

Number of examinations.....	44
Number sterile.....	21
Number giving cultures.....	23
Varieties of organisms:	
Staphylococcus.....	10
Streptococcus (never in pure culture).....	2
Bacillus perfringens.....	1
Tetanus bacillus.....	2
Putrefactive bacillus.....	6
Leptothrix.....	1
Number of bullets sterile.....	4
Number of bullets with organisms.....	11
Number of shell fragments sterile.....	16
Number of shell fragments with organisms.....	11
Time of latency:	
Staphylococcus.....	3-4.5 months
Staphylococcus and putrefactive bacilli.....	7 months
Leptothrix.....	1 month
Gram-positive bacilli.....	3-15 months
Bacillus perfringens.....	7 months
Staphylococcus and diphtheroid bacillus.....	30 months
Streptococcus pyogenes and tetanus bacillus.....	6 months



From this table it is evident that the bacillus *perfringens* may survive for a period of seven months. In the case in which this occurred the bullet was removed from the tibia where it did not cause any lesion visible to the X-ray. After its removal, the wound healed by first intention.

In another case streptococci and tetanus bacilli were found. Antitetanus serum was given. No tetanus symptoms appeared, but the wound suppurated.

The author presents the following conclusions:

1. Most pyogenic organisms are able to survive in the tissues for a period up to thirty months.

2. At any time they may give rise to inflammation, a possibility in at least 50 per cent of the cases.

3. Prophylactic measures before removal might be useful.

4. If possible, the missile should be removed completely in its capsule of fibrous tissue.

5. If this is impossible, the cavity should be carefully disinfected.

V. P. DIEDERICH.

**Piollet, P., Pellissier, P., and Weissenbach, R. J.: The Operative Indications Furnished by Bacteriological Examination in the Secondary Suture of War Wounds** (Etude critique des indications opératoires fournies par l'examen bactériologique dans la suture secondaire des plaies de guerre). *Lyon chirurg.*, 1918-1919, xv, 677.

The authors have made a very detailed study of the bacteria present in a series of 25 cases of war wounds with regard to their effect upon the success of secondary suture. They find that the outcome of secondary suture in war wounds of average severity, i. e., wounds of the soft parts involving the bones but without fracture, depends more upon the local anatomical conditions and the surgical technique employed than upon the bacteriological conditions. The chief points in the technique are:

1. The skin must be incised sufficiently far from the edges of the wound to insure absolute integrity of the papillary layer.

2. There must be complete excision of all scar tissue which sometimes is rather difficult on account of the presence of blood vessels and nerves.

3. Hemostasis must be complete before suturing is begun.

4. The edges of the wound must be accurately approximated for suture.

If in spite of these technical conditions the secondary suture fails, the cause will be found in local infection by streptococci or staphylococci. The presence of one of these types of bacteria in a wound does not always prevent primary union but the coexistence of both constitutes the most unfavorable bacteriological condition for the success of secondary suture. Other bacteria frequently met with in war wounds prevent the healing of secondary suture by first intention only exceptionally, failure in these cases being due usually to defective technique.

As far as is known there is no definite and constant clinical sign nor any fixed time which indicates immunity to the bacteria in a wound and warrants the success of secondary suture.

The patient's resistance to local infection may be increased, however, by previous vaccination of mixed anti-streptococcus and anti-staphylococcus serum.

Occasionally even with good surgical technique slight local complications are observed which may delay cicatrization after secondary suturing, but the alarming general complications which are sometimes seen after primary suture are never present.

As secondary suture gives quicker and better functional results than spontaneous cicatrization, it should be applied to all clinically sterile wounds even if a bacteriological examination cannot be carried out.

W. A. BRENNAN.

# GYNECOLOGY

## UTERUS

**Rawls, R. M.: The Status of Uterine Curettage Based on Hospital Records.** *Am. J. Obst.*, 1919, lxxix, 534.

About 96 per cent of gynecological cases show no endometrial changes and therefore curettage is unnecessary.

In the 4 per cent which show endometrial changes the procedure is of questionable therapeutic value.

As a diagnostic measure it is of practical value in only 5.1 per cent of cases of carcinoma of the uterus.

When curettage is performed in a hospital and by skilled operators, the morbidity is at least 5.5 per cent.

EDWARD L. CORNELL.

**Kelly, H. A.: The Treatment of Uterine Hæmorrhages from the Modern Viewpoint.** *Therap. Gaz.*, 1919, xliii, 229.

The question of hæmorrhage in the case of the uterus limits itself to the amount above normal and the effect it produces on the patient. An excessive, long-continued flow calling for frequent changes of napkins and weakening the patient is the common characteristic of a uterine hæmorrhage which can be diagnosed more easily in the individual case than defined broadly.

At the menarche and the menopause, irregularities in amount and time are common without being pathological. On the other hand, as symptoms of definite disease these phenomena may be disregarded entirely until intervention may be useless. Every menstruating woman, with few exceptions, demands some attention and care; she should have rest a day or two after the onset. The young girl should be instructed how to safeguard herself at this time, especially as regards exposure, catching cold, over-fatigue, and constipation. If the menstrual function is upset at the start, the irregularity is apt to continue and will be hard to set right later.

For unusual pain and excessive flow there is no treatment comparable to putting the patient to bed for a couple of days each month. The author knows of no drug that has the power to check or stop the menstrual flow. Ergot and ergotols are as useless as brick-dust. At the menopause every unusual flow should receive careful study until a diagnosis of cancer is disproved. An excess of bleeding is noted under the following circumstances: in young girls when menstruation starts; in married women in the child-bearing period; in the unmarried from 35 to 40; in the married from 35 to 40 and upward.

The common causes of hæmorrhage which ought to be borne in mind are the following: (1) the simple free flow in the young girl, an inexplicable

irregularity of the onset; (2) miscarriage in the married; (3) extra-uterine pregnancy associated with cessation of menstruation, irregularity or pains (not always with all of these, however, and sometimes with none of them); (4) a fibroid tumor or polyp (more rare) at about middle or more advanced life; (5) cancer of the body of the womb from thirty-five up; (6) cancer of the womb in the child-bearing woman; (7) ovarian tumors of one or both sides of the womb; these can usually be felt as considerable masses choking the pelvis; and (8) serious cardiovascular disturbances or blood diseases.

As a rule, the diagnosis of the cause of hæmorrhage is extremely simple. Ordinarily the young unmarried patient should be put to bed without an examination, but if the bleeding becomes alarming a rectal examination should be made. If necessary, gas may be given and a curettage performed. This has been done each month by the author for ten to fifteen months after the flow has gone beyond normal and saved these patients from mutilating operations. Again, the diagnosis may be simple as when the presence of a large fibroid tumor is discovered by laying the hand on the abdomen, or a friable, bleeding cervical cancer is found by introducing the finger into the vagina. Bimanual examination may reveal a bossed uterus not so large as a fibroid uterus; if it is uniformly enlarged the condition may be either cancer of the body or more probably the common but little understood myopathic hæmorrhagic uterus. The value of the rectal touch should not be overlooked in these examinations. In many obscure cases of early carcinoma dilatation and curettage will show the cause of the bleeding definitely. The scrapings should be hardened in 10 per cent formalin and then forwarded to some reputable pathological clinic.

If the disease is not malignant and the patient's condition not alarming, we may wait and watch. When the hæmorrhage is due to a fibroid, the simple act of curetting often gives prolonged relief; if nothing is found more than abundant endothelium, curettage is often enough. In the more severe hæmorrhages at or near the menopause the removal of the uterus may be necessary to stop the bleeding. In cases of bleeding from fibroids or the enlarged myopathic hæmorrhagic uterus, radium may be used to arrest the hæmorrhage. The author believes radium is preferable to operation in the treatment of fibroids; also when the physical condition of the patient precludes the possibility of an operation. In cases of cancer of the cervix it is the most satisfactory method of management, but cancer of the body of the uterus should be operated upon. In the more advanced cases radium offers the only ray of hope.

C. D. HOLMES.



**Hollender, A. R., and Gratiot, W. M.: A Non-Operative Procedure for the Treatment of Cervicitis and Endometritis.** *Am. J. Obst.*, 1919, lxxix, 523.

In cases in which there is an erosion of the cervix, 40 per cent silver nitrate solution is applied to the eroded surface and the cervical opening by means of an applicator. If there is no erosion, this initial step may be unnecessary. One dram of Beck's bismuth paste is then injected into the cervical canal by the use of either a glass intra-uterine syringe or a special metal syringe adapted to this purpose. If the cervical opening cannot be easily reached, a rubber catheter attached to the nozzle of the syringe makes it easily accessible.

For uterine injections the paste must be cold. As a rule, from two to four injections weekly will effect a cure in a comparatively short time.

Twenty-one cases have come under the author's care. Of these patients all but four have been discharged as cured. Two of this series had been previously curetted, but obtained only temporary relief.

The authors have received reports from other physicians who have adopted the paste method of treatment and the results obtained have been most encouraging.

EDWARD L. CORNELL.

**Gutierrez, A.: Remarks upon Surgical Operations for Uterine Fibromyomata** (Algunas consideraciones sobre intervenciones quirúrgicas por fibromiomas de útero). *Rev. argent. de obst. y ginec.*, 1919, iii, 11.

Gutierrez's article is based on 126 cases of uterine fibromyomata recently operated upon. Fifteen of the patients were from 20 to 30 years of age, forty-one from 30 to 40 years, forty-six from 40 to 50 years, and twenty-four from 50 to 60 years. Thirty-five of the women were unmarried. Thirty-five of the tumors were interstitial, 41 interstitial and subserous, and 12 submucous and situated in the cavity of the uterus.

Ninety-eight of the operations were performed by the abdominal route and comprised 15 total hysterectomies, 65 subtotal hysterectomies, and 18 myomectomies. Twenty-eight vaginal operations comprised 6 hysterectomies and 22 enucleations of the tumors. The author favors the abdominal route.

While admitting that roentgen and radium therapy open up a new field in the treatment of uterine fibroids, especially if matters of technique are settled, the author believes that in spite of the brilliant results reported and the enthusiasm of many who see no contra-indications, treatment by radium is not advisable under the following circumstances:

1. When there are adnexal complications.
2. When the fibromata are submucous and when they are found to be pediculated in the intra-uterine cavity.
3. Cases of subserous pediculated fibromata.

4. When there are symptoms of compression (bladder, urethra, rectum).

5. Cases of degenerated fibromata.

6. When the fibroma is associated with a carcinomatous or sarcomatous process.

W. A. BRENNAN.

**Villar, A.: Remarks Concerning the Treatment of Cancer of the Cervix of the Uterus by Radium** (Consideraciones sobre el tratamiento del cancer de cuello uterino por aplicaciones de radio). *Rev. argent. de obst. y ginec.*, 1919, iii, 16.

Villar has treated 5 cases of cancer of the uterine cervix with radium. In 3 the results were bad, in 1 excellent, and in 1 the time elapsed is too short to warrant a definite opinion.

In comparing these results with those obtained from the Wertheim operation, Villar concludes that in many statistics the word "operable" is often loosely and vaguely applied. In clearly operable cases the Wertheim method is neither difficult nor of very long duration when the operator is well acquainted with the technique. Before the advent of radiotherapy this operation was really obligatory and sometimes even gave unexpected results. Every case was operable in which extirpation was possible. In view of the results obtained from radiotherapy, however, the only cases which should be deemed operable are those which may be operated upon easily.

The statistics of the surgical treatment of cancer of the uterine cervix compare very well with those of radiotherapy, and as a matter of fact the limit of operability is higher than is usually stated by most writers. In a series of cases of this type of cancer in the author's service he found that 29 per cent were operable.

Villar is in favor of surgical treatment in every operable case.

W. A. BRENNAN.

**Strong, L. W.: Polypoid Adenoma of the Uterus.** *Am. J. Obst.*, 1919, lxxix, 502.

In the past five years several cases have been observed at the Woman's Hospital, New York, in which polypoid adenomata have developed into malignancy of a type which appears to have striking characteristics.

The adenomata, which are somewhat more irregular in outline and more firm than hyperplastic polypi, occur either in the fundus or the cervix of the uterus. Most frequently, however, they are found in the cervix and the uterine horns. On section, they are not uniform but show a rather honeycombed structure.

Adenomata originate in the basal layer of the mucosa, the glands lying in more or less definite groups. Their stroma is thick, their cells are large, and their vessels conspicuous. The glands are chiefly of the basal type, i.e., made up of simple tubules which may be dilated and are irregular in outline. They do not follow the typical menstrual



cyclic changes though they may show premenstrual outlines without functional activity in the form of secretion. According to Schroeder, these areas are not cast off during menstruation. They project more and more into the functional layers of the mucosa and thus ultimately form polypi. They show rudimentary division into a basal and an outer functional layer. Uterine adenomata are polypoid because they are surface tumors.

Microscopically the adenoma has in general all the characteristics which hyperplasia does not have. While it is not difficult to recognize a definitely formed adenoma, the changes which separate it from simple hyperplasia are not absolute. In the same way the adenoma merges into carcinoma.

Several cases are reported with many illustrations.

EDWARD L. CORNELL.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Potherat, E.: A Voluminous Multilocular Cyst of the Left Ovary and a Double Dermoid Cyst of the Right Ovary in the Same Woman** (*Volumineux kyste multiloculaire de l'ovaire gauche et double kyste dermoïde de l'ovaire droit chez la même femme*). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 385.

In the curious case reported by Potherat the large multilocular cyst of the left ovary contained about 8 liters of blackish, slightly viscid fluid.

In the right ovary was a bi-lobar cyst each mass of which was a separate and characteristic dermoid cyst the size of a mandarin orange. One of them contained hairs, a piece of bone, and a small tooth. The tube was not altered.

The patient was 30 years old and had had three normal labors. Her last pregnancy ended in a miscarriage after a few months. A multilocular cyst in a woman of this age is an unusual condition.

W. A. BRENNAN.

**Kynoch, J. A.: Primary Chorionepithelioma of the Ovary.** *Edinburgh M. J.*, 1919, xxii, 226.

Kynoch refers to previous cases of ovarian chorionepithelioma reported by Kleinhans, Iwase and Fairbairn, 4 in all, and then gives the data of a case of his own.

The patient was a multipara, 24 years of age, who complained of severe pain in the left iliac region, with an irregular vaginal hæmorrhage of six weeks' duration. Menstruation had been normal until fourteen weeks before admission to the hospital, when there was a period of eight weeks of amenorrhœa followed by the hæmorrhagic discharge mentioned.

Examination revealed a slightly enlarged uterus and a round, tender swelling, the size of a hen's egg, corresponding in position to the left ovary. Upon operation, this mass proved to be the left ovary, enlarged, nodular on the surface, and dark purple. Owing to its soft consistency, it was ruptured and

bled freely during its removal. Both fallopian tubes appeared to be unaffected. The patient recovered. Microscopic examination showed the tumor to have the characteristic appearance of a chorion-epithelioma.

The patient returned one month later with a swelling at the side of the abdominal incision, firm, tender, and the size of a billiard ball. This grew rapidly and the patient's general condition did not improve. Rectal examination revealed the presence of a soft, doughy tumor bulging into the lumen of the bowel. Attacks of vomiting and diarrhœa ensued and death occurred four weeks after the second admission to the hospital.

At autopsy a massive, nodular, semi-fluctuant growth was found occupying the pelvic cavity and adherent to the anterior abdominal wall. The uterus and bladder were unaffected. The rectum was much narrowed by pressure of the tumor, but its mucous membrane was not involved. The mesenteric glands were enlarged. The liver was enlarged, pale, and fatty, and had a small nodule on its under surface. The kidneys, spleen, heart, and stomach were normal. A small growth was found in the upper lobe of the left lung and several larger nodules appeared on the posterior aspect of the right lung. These secondary nodules showed, microscopically, the appearance of the primary growth.

CAREY CULBERTSON.

**Schwarz, E.: Cysts of the Corpus Luteum.** *Am. J. Obst.*, 1919, lxxix, 516.

The article describes the histogenetic mechanism of the formation of lutein cysts without referring to their primary etiology. The histologic character of these cysts permits a correct diagnosis even if no traces of lutein cells are found. Insofar as their macroscopic and microscopic recognition is of importance in the prognosis of the case, they form a distinct clinical entity. The relationship of cysts of the corpus luteum, the corpus nigrum, and the corpus albicans is considered with regard to their probable origin.

EDWARD L. CORNELL.

**Broun, L.: Adenomyoma of the Round Ligament Following Gilliam's Operation.** *Am. J. Obst.*, 1919, lxxix, 561.

The patient, aged 38, had had three children, the youngest of whom was 8 years old. Four years ago a Gilliam operation was evidently done with repair of the posterior vaginal wall. The result was in every way satisfactory.

When seen by the author the patient complained of a tender mass in the abdominal wall near the site of the laparotomy wound. This mass has been present for the past one and three-quarter years. For the past ten months it had become periodically tender with each menstruation. The pain which began at the beginning of menstruation increased in severity for ten days although the menstrual period lasted only two days, and at the end of the two weeks ceased, the patient then being free



from it until the beginning of the next menstrual period.

Examination showed the presence of a small tender mass 2 or 3 cms. in size, situated 5 cms. to the right of the abdominal scar in the site of the Gilliam implantation of the round ligament. This mass was superficial and appeared to be above the fascia.

Operation was difficult. A part of the tumor which was above the fascia was cystic. The larger part was within the rectus muscle, and the removal of some of the fibers was necessary before the tumor could be taken away. The dissection was continued to the peritoneal fascia. The unaffected part of the round ligament was readily recognized and reimplanted to the united fascial edges.

The growth proved to be an adenomyoma of the round ligament.

EDWARD L. CORNELL.

**Waters, C. H.: Torsion of an Enlarged Hydatid of Morgagni as the Cause of Acute Abdominal Disturbance.** *J. Am. M. Ass.*, 1919, lxxii, 1072.

The author reports the case of a woman who first consulted him Feb. 5, 1918. On the preceding day she had been rather suddenly seized with cramping pains in the lower abdomen, especially on the left side. Associated with the pain were unusually severe and repeated vomiting and extreme prostration. The temperature was 101, the pulse 130. The abdomen was rounded and moderately tympanitic. Tenderness on pressure was most marked in the left hypogastric region. Spasm and moderate rigidity of the rectus were noted on the same side. The rectal examination was negative except that tenderness was discovered high up on the left side. The blood showed a leucocytosis of 16,800 with 86 per cent polymorphonuclears.

At operation, a small amount of blood-tinged serous fluid was discovered in the pelvis. At the outer extremity of the left tube was a large, purplish black hydatid of Morgagni which, in size and shape, approximated a large olive and had a pedicle  $1\frac{1}{2}$  inches long. A twist of one complete turn was noted in the pedicle when the structure was elevated, but it may be assumed that a greater degree of torsion had existed previously and that partial unwinding had occurred spontaneously or as a result of exploratory manipulation in the pelvis.

The cyst was quite tense and over its surface were numerous engorged veins. After ligation of the pedicle it was removed. Both ovaries, which were found enlarged owing to the presence of numerous atretic follicles, were partially resected, and the appendix which was in the usual situation and otherwise normal, was removed. The abdominal cavity was carefully explored but no other pathologic condition was found. The operation was completed with a dilatation of the cervix. Convalescence was uneventful. Subsequent menstruation has been regular and practically without discomfort. The patient's general health improved markedly, and she gained 10 pounds in five weeks.

EDWARD L. CORNELL.

## MISCELLANEOUS

**Griffith, W. A. S.: Symposium on Reconstruction in the Teaching of Obstetrics and Gynecology to Medical Students.** *Madras M. J.*, 1919, ii, 75.

The importance of a thorough training in obstetrics for students of medicine who, with few exceptions, will enter general practice is generally recognized. Gynecology is so intimately bound up with obstetrics that any attempt to teach them as separate subjects is futile. Preventive gynecology requires very thorough teaching.

The subjects to be taught include: the obstetrical anatomy of the pelvis; the anatomy of the pelvic organs; the physiology of the generative organs; pregnancy in all its divisions; labor; the puerperium; the pathology of pregnancy, intra- and extra-uterine; and the pathology of labor.

The long wearisome courses of lectures which used to be customary in the medical schools are not the best method of teaching. Good lectures well illustrated by personal experience are of greater value to the advanced students. Demonstration lectures, well illustrated with plenty of oral questioning, help to maintain close attention and enable the lecturer to discover if the students have learned anything from his previous lectures.

The subjects which can be well taught in this way are the obstetrical anatomy of the pelvis and its contents, menstruation, the anatomy of pregnancy, labor, the puerperium, and the mechanism of labor which should be taught with a foetus, not with the foetal skull only. The remaining subjects, comprising the great bulk of the whole, should be taught by demonstration lectures accompanying clinical work in the wards and out-patient rooms.

If the taking of case histories is done systematically and according to a scheme of which each student has a copy, the power of forming correct opinions about the nature of the ailment from the history alone will be gradually acquired.

The personal responsibility for forming correct opinions as regards diagnosis, prognosis and treatment cannot be inculcated too soon. The amount of time this kind of instruction takes is considerable, and much patience is needed, but its value not only to the individual student but to the whole class is well worth it.

The importance of out-patient training to the student is great. From it he learns to diagnose the position of the foetus and to measure the pelvis. Above all, he learns the value of systematic examination of all women in advanced pregnancy, of being sure that all important details are normal before confinement, and of being forewarned of difficulties and complications.

The chief difficulty in gynecological ward teaching at the present time is due to the abundance of surgical material which interests and occupies the time of the gynecologist to the exclusion of cases which are of great importance for teaching. Experience in the major operations, though advan-



tageous, is of small value to the student for from it he learns too little of the minor gynecology which will come to him in general practice and by it he is induced to take little interest in cases not needing operative treatment. EDWARD L. CORNELL.

**Drage, L.: The Teaching of Obstetrics and Gynecology from the Point of View of a General Practitioner.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, 49.

The claims made upon the time of the student by the teachers of special departments are increasing and at no period have heavier demands been made for the inclusion of new special subjects into the curriculum than at present. If every professor in special subjects were to be humored, he would not envy the lot of medical students.

At the present time a student begins the study of obstetrics and gynecology with a course of lectures and instruction in the wards. A very large part of gynecology is purely surgical and should be treated as part of the course in surgery. The subjects to which the teachers of diseases of women and midwifery should devote themselves should be just those which were theirs before surgery arrived at its present state of perfection. EDWARD L. CORNELL.

**Graves, W. P.: Unsolved Problems in Gynecology.** *Am. J. Obst.*, 1919, lxxix, 666.

The first problem which gynecology has to meet is purely educational. With a very few exceptions, gynecology is inadequately taught in the medical schools of this country. This statement refers not alone to the insignificant position assigned to the clinical and didactic instructor of the subject in the various curricula, but to the scant attention paid to gynecological histology and pathology in the earlier laboratory courses.

A more difficult but more fascinating field of research is that of gynecological physiology. In this branch the problems are numerous and baffling, and it is due chiefly to the fact that they are not solved that the present progress of gynecology is at a standstill.

To the investigator who wishes to study the clinical aspects of cancer, gynecology offers the greatest opportunities. Another fertile field of research is the chemistry of the ovarian secretion which at present, as far as practical results are concerned, is little cultivated. To the student who has access to radium the treatment of non-malignant myopathies by radiotherapy offers an opportunity for investigation which can promise immediate results of great value.

At the outbreak of the war the Germans were leading in the output of scientific literature relating to gynecology. However, like much of the German scientific work, though awe-inspiring by its laboriousness, it was for the most part casuistic, recapitulatory, self-conscious, and contemptuous of the work of other nations. Germany is now out of the

game, and to America falls the task of taking the lead not only in the theory of gynecology but in that of all medical science. EDWARD L. CORNELL.

**Goff: The "Follow up" System in the Woman's Hospital, New York.** *Am. J. Obst.*, 1919, lxxix, 544.

Notification that the patient is a candidate for discharge is sent to the social service department by the nurse in charge of the ward. Within two hours a worker visits the patient in the ward. The objects of this visit are:

1. To impress the patient again with the importance of visits to the "follow-up clinic."
2. To arrange the date of the first visit.
3. To present the patient with a record card.

The first visit made by the patient to a "follow-up clinic" is set for a date approximately one month from the date of discharge. Subsequent visits are arranged according to the following rules:

1. Patients treated for malignant neoplasms are to remain under observation for a period of five years and should make four visits to the "follow-up clinic" every year.

2. Patients upon whom abdominal section has been performed should remain under observation for two years, making four visits the first year and two the second.

3. Patients upon whom plastic operations have been performed should remain under observation for three years. Four visits should be made the first year and two each year thereafter.

4. Patients upon whom minor operations have been performed should remain under observation for a period of six months.

During the period beginning Oct. 1, 1917, and ending Sept. 30, 1918, 1,161 "follow-up abstracts" were made out for patients treated in the free wards of the Woman's Hospital. Of that number, 62 per cent have responded promptly and satisfactorily to requests for visits to the "follow-up clinics," 20 per cent have responded in a partially satisfactory manner, and 18 per cent have refused to return for examination. Of the 20 per cent responding in a partially satisfactory way, a large majority returned a sufficient number of times to warrant certain conclusions in regard to the success or failure of the treatment. EDWARD L. CORNELL.

**Mercadé, S.: The Lesions in Genital Prolapse and Their Surgical Treatment** (Les lésions dans les prolapses génitaux et leur traitement chirurgical). *Arch. mens. d'obst. et de gynéc.* 1919, vii, 306.

To date, the anatomo-pathologic lesions in genital prolapse have been described in a somewhat too schematic manner. The term "genital prolapse" has been made to cover different lesions some of which are merely the consequences of others and phases of the same pathogenic process. Lack of balance of the pelvic organs is due to one and the same cause, abdominal pressure, which tends to force them through a pelvic diaphragm not able to resist such pressure.



Of these lesions some occur very frequently because they correspond to the first stages of this pressure; such are cystocele and descent of the uterus. Complete prolapse, rectocele, and inversion of the uterus correspond to its later development.

The condition of the pelvic floor is very important. Often when a woman with prolapse is examined the perineum will be found apparently intact though it may be the site of deep lesions. Another important factor is degeneration of the anterior segments of the levatores.

Mercadé's operative technique which is directed toward strengthening the pelvic structure against abdominal pressure is described as follows:

1. The patient is placed in the gynecological position and the prolapse made evident by traction on the neck of the uterus.

2. An anterior colporrhaphy is done by excising a large lozenge-shaped piece of the anterior wall of the vagina.

3. The bladder is separated from the vagina and uterus, special care being taken not to injure the bladder. The lateral surfaces are stripped first and then the rear and front surfaces, the stripping being begun with the aid of the bistoury and followed up with the finger.

4. The internal position of the levatores is then determined and four chromotized catgut sutures are placed inside the borders of each. The borders are then united on the median line to form a floor beneath the bladder.

5. Suture of the vaginal wound.

Mercadé has for some time discontinued all other methods of treating prolapse in favor of this anterior suture of the two levatores with which he obtains perfect results. He re-examined all of his patients after several months and found no recurrence.

The anterior colpoperineorrhaphy described is applicable also to hypertrophic elongation of the neck of the uterus associated with cystocele.

W. A. BRENNAN.

**Hager, B. H., and Becht, F. C.: Action of Viburnum Prunifolium.** *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 61.

The results of this investigation indicate that the effect produced on the uterus by alcoholic extracts and decoctions of viburnum prunifolium bark are of little consequence in modifying the nature of the uterine activity. No uniform pharmacological effect can be ascribed to the drug, for while in one instance stimulation may seem evident, a similar dose given at another time under the same conditions produces an apparent inhibition or no perceptible change whatever.

As compared with the effect of drugs known to have a specific action on the uterine contractions, such as that of pilocarpine and pituitary extracts on the pregnant uterus, the effect of viburnum prunifolium is negligible. The changes in the contraction of the uteri of experimental animals which sometimes

occur on the administration of an extract of viburnum prunifolium bark are so slight that they may be explained as having been produced reflexly through manipulation of the animal during injection or by the alcohol which holds the drug in solution. It has been demonstrated that in the uteri of animals rendered unconscious by high section the intravenous injection of alcohol causes a temporary inhibition or stimulation.

MAX KAHN.

**Heineberg, A.: Adenomyoma of the Rectovaginal Space.** *Am. J. Obst.*, 1919, lxxix, 526.

The chief symptoms are pain and menorrhagia. Two types of pain are described, a grinding sensation in the lower abdomen and a distressing fullness or pressure in the rectum which is aggravated during defecation. An interesting as well as important point is the persistence of the painful pressure in the rectum for several days after the cessation of the menstrual flow.

The tumor presents itself as a dense, indurated, nodular or flattened mass beneath the upper part of the posterior vaginal wall to which it is usually closely adherent as well as to the rectal wall. When of large size or situated high up, the mass becomes fixed to the supravaginal cervix and is movable only with the latter. Spreading along the route of the pelvic connective tissue it involves the broad and uterosacral ligaments and extends even to the pelvic walls. In such cases the entire pelvic contents become fixed as in massive pelvic cellulitis.

All writers agree that adenomata of the rectovaginal space should be removed as soon as possible.

The author reports two cases treated successfully.

EDWARD L. CORNELL.

**Tilmant, A.: The Relation of Exophthalmic Goiter to Ovarian Insufficiency** (Des relations du goitre exophthalmique avec l'insuffisance ovarienne). *Presse méd.*, 1919, xxvii, 164.

Of the various conjectures regarding the pathogenesis of exophthalmic goiter, Tilmant prefers the theory ascribing it to a disturbance of the glands of internal secretion. The part played by disturbances in the corpus luteum secretion in the genesis of thyroid hypertrophy and exophthalmic goiter has been demonstrated.

Recently the author has observed six cases of Basedow's disease in women of the same family. The histories showed that the appearance of the symptoms coincided with periods of ovarian disturbance chief of which was insufficiency, either partial or total.

The author's conclusions are as follows:

1. Basedow's disease is a dysthyroidism characterized by a change in either the character or quantity of the thyroid secretion.

2. This dysthyroidism is dependent upon a predisposition, some primary alteration either in the thyroid gland itself or its sympathetic system.

3. While the causes of the dysthyroidism are various, we must look especially for toxæmia, acute

or chronic infections, or hyper- or hyposecretion of the glands of internal secretion in seeking the causative factor in a particular case.

W. A. BRENNAN.

**Mercadé, S.: The End-Results of Suture of the Anterior Perineum for the Radical Cure of Genital Prolapse in Woman** (Les résultats éloignés de la suture du périnée antérieur pour la cure radicale des prolapsus genitaux de la femme). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 505.

Most surgeons are today agreed that the usual methods employed do not effect a radical cure in genital prolapse in woman; there is, moreover, a general tendency to recognize the fact that the underlying cause in prolapse is weakness of the perineum and efforts are now being directed toward strengthening the perineal floor.

While nearly all surgeons have turned their attention to the posterior floor of the perineum,

Mercadé's procedure is directed toward the anterior floor, his method being an anterior col-poperineorrhaphy. After making a wide incision of the anterior vagina and separating the bladder from the uterus, he seeks the anterior part of the levators, passes chromic catgut sutures through the edges, draws the levators together, and knots the threads.

Excellent results, which remained unimpaired more than six months after the operation, were obtained in this manner in six cases. In one case the operation was performed more than a year ago. These patients had complete prolapse of a most severe and painful type.

Discussion of the article brought out the fact that the method of suturing the anterior perineum is old, but that while suturing of the levators is considered a necessary part of every good perineorrhaphy, the exact area where this suture should be placed is not generally agreed upon.

W. A. BRENNAN.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**White, C.: Two Cases of Puerperal Anuria in Which the Renal Capsule was Incised and Portions of the Kidney Substance Removed for Examination.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, 27.

White reports two cases of puerperal anuria following eclampsia at about the sixth month. In both, the kidney capsule was incised and a minute section of the kidney was removed for examination. Following the operation the urinary output was increased and the convalescence uneventful.

In the sections examined there was marked dilatation of the tubules and more or less degeneration of the cells lining them. Some of the tubules were filled with granular material. The glomerular cells were little changed but the surrounding clear space was increased. There was small-cell infiltration of the interstitial cells and the connective tissue was both increased and œdematous. No thrombosis of the vessels was observed.

On the basis of the routine examination of the kidneys of eclamptics during operation, the author concludes that the thrombosis and cortical necrosis usually found in such cases are terminal phenomena and not the actual cause of the suppression. Invariably when anuria is associated with eclampsia the kidney tension is increased, while if anuria is not present, the kidney is soft. W. F. HEWITT.

**Torre y Blanco, J. de: Acute Hydramnios in a Tuberculous Woman** (Caso de hidramnios agudo en una tuberculosa). *Arch. de ginec., obst. y pediat.*, 1919, xxxii, 36.

In this article is reported a case of rapid acute hydramnios in a woman, aged 26 years, who had a tuberculous process involving the right lung. The condition was diagnosed at the end of the sixth month of pregnancy which was thought might possibly be a twin pregnancy. In the author's opinion, acute hydramnios is often associated with twin pregnancy and especially twin pregnancy which is unioval.

In the case reported, labor was induced by puncture during the seventh month. An enormous quantity of amniotic fluid was expelled. The woman gave birth to two female unioval foeti both of which were dead. One of them had died quite recently. The puerperium was normal. W. A. BRENNAN.

**Harris, J. W.: Influenza Occurring in Pregnant Women: a Statistical Study of Thirteen Hundred and Fifty Cases.** *J. Am. M. Ass.*, 1919, lxxii, 978.

It was assumed that the 1,350 cases on which these statistics are based were serious enough to

require medical attention. This number does not include the very mild cases, nor many of those which occurred within the first two months of pregnancy when gestation might easily escape the physician's knowledge. With these reservations, the results of the study were as follows:

1. Pneumonia complicated the influenza in about one-half of the pregnant women.

2. In the cases complicated by pneumonia, about 50 per cent of the patients died, the mortality being somewhat greater during the last three months of pregnancy.

3. The gross mortality of all cases was 27 per cent.

4. Pregnancy was interrupted in 26 per cent of the uncomplicated cases, and in 52 per cent of those complicated with pneumonia. In the cases ending fatally, abortion or premature labor occurred in 62 per cent. Thus, in 38 per cent of the fatal cases the patient died without interruption of pregnancy.

5. The mortality of influenza was considerably higher (41 per cent) in the cases complicated by abortion or premature labor than in those in which pregnancy was uninterrupted (16 per cent).

EDWARD L. CORNELL.

**Hellier, J. B.: Clinical Study of 108 Cases of Ectopic Pregnancy.** *Practitioner*, 1919, cii, 169.

Hellier reports 108 cases of ectopic pregnancy observed in nineteen years of practice. This is 1.7 per cent of the in-patients in the wards of the Leeds General Infirmary. He has noted that the condition frequently occurs following a long period of sterility which is perhaps associated with a tubal disease. The clinical history in the early stage is obscure, especially when there is no amenorrhœa.

The coincidence of vaginal and intra-abdominal hæmorrhage explains why so many cases are confused with abortion.

Cases in which the hæmorrhage still persists are best treated by early abdominal section. When there is a large hæmatocele, expectant treatment does not yield the best results.

A diagnosis before rupture is rarely to be expected W. F. HEWITT.

**Jensen, M. J.: Placenta Prævia and Abruptio Placentæ.** *J.-Lancet*, 1919, xxxix, 197.

Cases of placenta prævia may be classified into two groups, i. e., those in which labor has not begun and those in which it has begun. When the bleeding begins before labor, the interests of the child demand expectant treatment consisting of absolute rest and the administration of sedatives. If after sedative treatment has been tried the hæmorrhage recurs before labor has started or if there is a single profuse



hæmorrhage, active measures are indicated at once. In every case of placenta prævia and accidental hæmorrhage the strictest precautions for asepsis must be taken and the preparations should be as thorough as for any surgical operation. In a certain number of these cases cæsarean section is always indicated. These are:

1. Cases of primigravida and others who have sufficient pelvic obstruction to prolong labor seriously.

2. Cases of rigid and undilatable cervix in which the indications suggest prolonged labor.

3. Most cases of placenta prævia centralis and placenta prævia complicated by eclampsia.

In accidental hæmorrhage the method which empties the uterus most quickly without producing shock or injuring the soft parts is dilatation, version, and extraction. Cæsarean section should never be done as a routine measure unless the child is viable and the mother a good surgical risk.

All cases should be considered carefully. Whenever possible the treatment should be limited to the more conservative methods. When it is necessary to decide upon radical treatment the decision as to the method should be left to the judgment of a well-trained obstetrician.

C. D. HOLMES.

**Fisher, J. M.: The Diagnosis and Treatment of Abortion.** *Therap. Gaz.*, 1919, xliii, 233.

This article deals with the diagnosis and treatment of the types of abortion ordinarily met with in practice. The more important of these cases are of the so-called clean type, for the seriously septic abortions have become so through ill-advised manipulations in clean cases. With very few exceptions, threatened, inevitable, complete, and incomplete abortions were originally clean cases.

Clean abortion; threatened abortion: A pregnant woman may have intermittent uterine contractions, pain, hæmorrhage, and dilatation of the cervix with bulging of the membranes followed by subsidence of all of these and continuance of gestation. When such symptoms are present, a hypodermic of morphine and every four or five hours thereafter the use of the following suppository is very satisfactory:

Extract opii, .gr. i  
 Extract hyoscyamus, gr. ss.  
 Oleum theobromatis, q. s.

Tamponing the vagina is fraught with the danger of exciting reflex uterine contractions which may convert the condition into an inevitable abortion. The patient should be kept in bed at least a week after the disappearance of all symptoms.

Inevitable abortion: An abortion becomes inevitable as a result of: (1) the death of the embryo; (2) detachment of a large portion of the ovum; and (3) rupture of the ovum. During the early weeks of pregnancy it is obviously very difficult to diagnose the first two conditions, so that while the ovum remains intact the conscientious practitioner may try to save it from destruction. If the abortion has

become inevitable and the patient is under the care of the family physician who may be reached on short notice, the plan of watchful waiting may be followed with reasonable assurance that in time the uterus will empty itself spontaneously. On the other hand, if the physician cannot be reached promptly, or if the patient's general condition is such as to be harmed by even moderate bleeding, the vagina should be tamponed under the strictest precautions for asepsis. If necessary, this packing may be repeated after from four to twelve hours. As all forms of intra-uterine manipulations are attended by a certain risk of infection, such interference should be avoided if possible.

Complete abortion: While from the standpoint of the absence of chorionic villi, placental tufts, or shreds of membrane, no abortion may be said to be complete in the early weeks of pregnancy, the placenta vera is usually discharged as débris after the expulsion of the ovum. Even in such cases, however, it may be necessary to slip an obstructing clot aside with the gloved finger in order to establish good drainage, though there is more danger from too early, rather than from too late, interference.

Incomplete abortion: In this condition we face the problem of the retention of portions of the ovular envelope or of placental structure which, with few exceptions, will be discharged spontaneously if given sufficient time. In the author's opinion, the seriousness of the retention of these products has been considerably over-estimated by a certain contingent of the profession. Interference offers more risk of infection than waiting. The danger of profuse hæmorrhage is immediate and may be met promptly. The average doctor should content himself with vaginal tamponade without any intra-uterine manipulation whatever. The removal of the tampon after twelve to twenty-four hours is usually followed by expulsion of the retained material, though exceptionally it may be necessary to repack the vagina. If the cervix is well dilated and the ovular mass is presenting at the cervix, the latter may be expressed by external compression of the uterine fundus or withdrawn by means of a wide-blade placental forceps. Intra-uterine irrigation is condemned. The advisability of vaginal douching is questionable. In any case requiring localized attention nothing supersedes the importance of the strictest asepsis and antisepsis on the part of the physician. Following this type of abortion and the ultra-conservative method of managing it, it may be necessary later on to dilate, curette, and pack the uterus to remove a so-called placental polyp.

Infected abortion: The severity of a uterine infection in different persons by the same organism varies in type from the most malignant with a fatal termination in a few hours to a type with symptoms so mild as almost to escape detection. These clinical variations are usually accounted for by one or more of the following conditions: "(1) the biochemical or



bactericidal properties of the involved localized structures; (2) the patient's constitutional resistance; and (3) the character and behavior of the micro-organisms. Generally speaking, the patient who, within twenty-four hours after an abortion, has chills and high fever and a uterus free from retained material is in much more danger than a patient who, after three or four days, has a foul discharge. In the former the uterus is the carrier of pathogenic bacteria to the circulating medium, while in the latter there is a definitely defined process limited to the cavity of the uterus. It is well recognized that the first type can not be benefited by local interference, and it is evident that unless there is gross obstruction or undue delay on the part of the uterus in discharging its contents, the second type of infected abortion also can not be interfered with safely in this way.

With comparatively few exceptions, the active local treatment of septic abortion is unscientific and illogical, and clinical experience has shown that as a routine procedure it is unwarranted.

C. D. HOLMES.

#### LABOR AND ITS COMPLICATIONS

**Pouliot, L.: Hypophysary Extracts in Obstetrics and Gynecology** (Les préparations hypophysaires en obstétrique et en gynécologie). *Rev. mens. de gynéc., d'obst., et de pédiat.*, 1919, xl, 64.

Pituitary extract has won an important place in the treatment of operative shock. Although shock is rarely seen in ordinary obstetrical operations, it is observed occasionally after the various types of cesarean operations and after major gynecological operations such as hysterectomy.

Beside postoperative shock there are also other conditions in which the arterial pressure, the energy of the cardiac beats, and the regularity and strength of the pulse are much improved by hypophysary extracts. Such conditions are posthemorrhagic acute anæmia following delivery, placenta prævia, uterine rupture, and the rupture of an ectopic pregnancy.

Opinions are divided in regard to the effects of hypophyseal extract on the hæmorrhages following delivery. Such injections when given in the beginning of labor may occasion hæmorrhages; when given late, they prevent inertia. Some have stated that the extracts have occasioned serious disorders, either local (such as uterine tetany and even rupture of the uterus) or general (such as syncope or high blood pressure). These disturbances, however, have been observed only in women with heart disease, cervical rigidity or other conditions in which the use of extracts is contra-indicated.

A common indication for the use of hypophyseal extracts in obstetrics is secondary inertia, the "slackening" of labor, regardless of the cause and especially in cases of contracted pelvis.

In gynecology, pituitary extract is useful as a hæmostatic in uterine fibroids, in dysmenorrhœa

and amenorrhœa, and in chronic lesions of the uterus and adnexa.

Pituitary extract may be useful also in the prophylaxis of puerperal infection even when it has passed the limits of the uterus and developed into peritonitis. Klotz, Houssay, and others have shown that the immediate causes of death in peritonitis are circulatory depression, failure of the pulse, a fall in the arterial pressure, and hypothermia, with accessory intestinal paralysis and the resulting absorption of toxins. Hypophysary medication combats both sets of symptoms by its action on the vascular system and its known effects in intestinal paresis. The extract of the posterior lobe of the hypophysis should be used and injected intramuscularly in a dose of  $\frac{1}{2}$  cc.

W. A. BRENNAN.

**Foulkard, C.: Induction of Labor by the Use of Bougies.** *Am. J. Obst.*, 1919, lxxix, 550.

In the 23 cases which furnish the basis of this paper labor was induced in 6 because of toxæmic conditions in the mothers, in 6 others for contracted pelvis, in 7 for R.O.P. at term, in 1 for placenta prævia, in 1 for transverse position, in 1 for double mitral heart lesion, and in 1 for pyelitis. This series therefore furnishes a good representation of the conditions for which the operation is applicable today.

Recently the author has been using two silk bougies with or without iodoform gauze packing to induce labor. These bougies must be well placed. It is his custom to dilate the cervix first with the fingers and then carefully separate the membrane around the internal os.

Labor pains may come on immediately or not for forty-eight hours. Multiparæ pursue a regular course of labor, securing complete dilation and expulsion of the child spontaneously.

The only babies lost in the above series were those of highly toxic mothers and were usually of doubtful vitality.

EDWARD L. CORNELL.

**Dorland, W. A. N.: Watery Accumulations in the Fœtal Abdomen Obstructing Labor.** *Am. J. Obst.*, 1919, lxxix, 474.

The author reports the case of a young married woman, aged 24 years, in whom labor began at about 7 o'clock one morning when she was approximately seven and a half months pregnant with her first child. She had experienced good health throughout gestation, but no fœtal movements had been noticed for several days. The pains were normal in nature and the labor progressed satisfactorily until 1 o'clock when a somewhat undersized head was born immediately after the discharge of a small amount of liquor amnii. The mother on attempting to extract the child by making traction upon the head was horrified to find a separation from the fœtal body taking place. She thrust the head back into the vagina and summoned help.

On making digital examination the fœtal head was found to be almost totally detached, merely a



few shreds of tissue connecting it with the body which was tightly jammed in the superior strait of the pelvis. The body presented no characteristic features but the arms could not be felt. A great cystic mass filled the maternal pelvis, slightly projecting below into the well-dilated cervical canal. The abdomen was tense and immensely distended; no foetal structures could be detected. While the attempt was being made to carry the finger around the mass of tissue protruding through the cervix, the woman suddenly experienced a severe uterine contraction and the cystic tumor virtually exploded, covering the examiner with an immense volume of fluid. The tumor had collapsed, and with but very slight effort the foetal body was delivered, practically falling into the physician's hands. The foetus was 40 cm. long.

A ragged opening was found in the torn tissues left by the avulsion of the head; through this hole the fluid had found vent. The thoracic and abdominal cavities were practically a single cavity. At some time in the development of the disease the diaphragm had been ruptured by the extreme abdominal distension, or else there had been a congenital perforation of that structure, the edges of which could be readily detected attached to the somatic walls. The lungs, heart, and great vessels were compressed into the upper, posterior thoracic region. The abdominal walls were immensely distended, thin, almost transparent, and not at all oedematous. The alimentary canal was normal in appearance except at its lower portion. The peritoneal surface everywhere had lost its usual glazed appearance and was covered at points by flakes of placental lymph. The rectum seemed to end in a cul-de-sac, and an external examination revealed absence of the anus. The bladder was small and to all appearances normal. The urethral canal was almost impervious. Examination of the specimen clearly showed that the condition was foetal ascites with chronic peritonitis, but the etiology was not apparent.

A brief report of all cases in the literature is given and a complete bibliography appended.

EDWARD L. CORNELL.

#### PUERPERIUM AND ITS COMPLICATIONS

**Wallich, V.: Comparison Between Puerperal Infection and Some Surgical Infections** (Parallèle entre l'infection puerpérale et quelques infections chirurgicales). *Presse méd.*, 1919, xxvii, 162.

The studies made during the past few decades on the uterine wound and its infection in the course of the puerperium have established a number of facts identical with those observed in war wounds.

The degeneration of the uterine mucosa, while preparing for and facilitating the detachment of the ovum, has also as a consequence the formation of necrosed tissue which is very favorable for the development of bacteria. In certain cases the postpartum infection of the uterus may be considered

equivalent in type to the massive infections which occur in severe traumatism.

The study of puerperal infections has demonstrated the presence of two types of bacteria, one of which is localized on the surface of the uterus and in its wall, and the other generalized and involved in the diffusion of the infection. The chief agent in both types is the streptococcus.

In war wounds, as in the postpartum uterus, are mortifying tissues in which infection finds a favorable breeding ground and in these lesions also the streptococcus plays the most important part. When a localized war wound infection becomes generalized, the same distant phenomena are observed as in puerperal infection.

The treatment of infected war wounds is similar to that of puerperal infections. Intermittent, and especially continuous, intra-uterine injections have the same proteolytic effect on the degenerated uterine surface as the hypochlorite treatment used by Labarraque, Carrel, and others has in war wounds.

The use of the curette in the uterus following abortion, first done by Récamier in 1845 and revived by Pozzi in 1891, although not generally accepted, is nothing more than the parallel of the use of the bistoury for the removal of dead tissues as applied in the most recent treatment of war wounds.

While the facts in regard to puerperal infections have been of very great benefit in the treatment of the wounds of war, reciprocally the study of the infected wounds of war has thrown much light on the treatment of puerperal infection. Both surgeon and accoucheur are in agreement that the removal of the focus of infection should form the basis of the treatment.

W. A. BRENNAN.

**Boys, C. E.: Complete Muscle Operation in Primary and Secondary Perineorrhaphy Immediately Following Labor.** *J. Michigan M. Soc.*, 1919, xviii, 153.

Boys reports 41 consecutive cases of fresh lacerations, including three third-degree lacerations, which were operated upon at the time of labor, and 20 consecutive cases in which there were old scars and upon which he performed a complete muscle operation also at the time of labor. His conclusions are:

1. The febrile reaction following complete repair of the perineum is due more to the delivery than to the operation. This is proven by the fact that the morbidity percentage was higher when repair was not done than in cases operated upon.

2. The complete muscle operation in the repair of fresh tears at the time of labor is a justifiable procedure as is evident from the fact that 69 per cent of the patients had normal recoveries and 26 only a slight febrile reaction, while complications occurred in only 5 per cent and in these the result was satisfactory.

3. The anatomical results in both primary and secondary repairs at the time of labor are as good as or better than, those of the late operation.



4. The saving of time and expense to the patient is well worth while in view of the above considerations.

W. F. HEWITT.

### MISCELLANEOUS

**Virasinghe, L. N.: The Child Welfare Scheme.** *Madras M. J.*, 1919, ii, 69.

For the treatment of the common diseases of children, the homes in India are anything but ideal. The mother or other person in charge is not a nurse and instructions are often not carried out because of the lack of means. When the husband is a peon, cleanliness means an outlay which cannot be afforded. In Madras, therefore, a children's hospital is a great need.

Even with such a hospital in good working order, however, and many consultation centers all over the city with trained health visitors and efficient nurses attached, very little change will be observed early in the death rates among children. The child welfare scheme by itself can do little to reduce this rate; the related schemes of education and sanitation must help.

The relief of poverty and the resulting unsatisfactory conditions must occupy the mind of every true citizen. A general march toward cleanliness must be begun and the conscience of the public toward proper sanitation aroused. The food eaten at the present time is not clean and will not be as long as the material sold as tamarind in the bazaars finds ready admission to the kitchens. Many of the people still see no danger in exposing their skins to dust which is laden with the worst impurities from the dirtiest slums and steets; many more perhaps do not see why the barber woman (midwife) is objectionable. There must be awakened in all, rich and poor alike, the desire for clean food, pure air, and clean homes.

EDWARD L. CORNELL.

**Sreenivasamurthi, G.: The Social-Economic Aspect of Child Welfare.** *Madras M. J.*, 1919, ii, 81.

In India a high birth-rate is associated with a high death-rate, especially among infants. The cause of this appalling death rate is ignorance, for the majority of the children are born in fairly healthy condition and if fairly managed from the start would have some chance of living.

In countries where preventive checks do not prevail, it is the increase or decrease in the number of marriages which primarily affects the increase or decrease in the birth-rate, but where such checks do obtain, as in England, France, and some other countries, a declining birth-rate and an increasing marriage-rate often co-exist.

In India such regulation of families by artificial means has not yet become prevalent. It may therefore be said that the birth-rate is a factor of the marriage-rate, which again is largely influenced by certain social customs. Chief among the latter is the custom of universal marriage, more especially

among girls, and early marriages (including the marriage of babies) among certain classes of the population.

It is generally held that the number of children per marriage varies inversely with the age of the marrying couple. Therefore the number of children and the interval between successive pregnancies are less among couples which marry late than among those which marry early.

Undoubtedly it may be desirable that the unduly high birth-rate in India should be brought down to a reasonable level, but this should not be less than the death-rate or the people would be on the high-road to national self-extinction.

EDWARD L. CORNELL.

**McCormack, C. O.: A Plea for Prenatal Care.** *J. Indiana M. Ass.*, 1919, xii, 98.

In the United States, 300,000 children under one year of age die annually.

DeLee says, "Not the majority but the minority of labor cases is normal." Child-bearing is a normal function which is dangerous to public welfare. There is no stronger conserving force of the race today than intelligent prenatal care by which is meant preventive medicine as applied to obstetrics. The chief results of this work are as follows:

1. A decrease in infant mortality by as much as 50 to 70 per cent.

2. Healthier and heavier babies, the average weight being raised from 7 pounds, 4 ounces, to 7 pounds, 11 ounces.

3. A reduction in the number of still-births. In the Borough of Manhattan, N. Y., in 1911, there was a reduction of the still-births from 48.6 to 19.6 per thousand. Still-births usually result from some chronic disease in the mother, such as syphilis or nephritis.

4. A reduction in the number of miscarriages due to improvement of the mothers' general health.

5. A reduction in the number of premature births due to the maintenance of better health in the mothers.

6. A greater number of normal births.

7. A reduction in the number of cases of toxæmia and eclampsia, the latter being reduced by 80 per cent.

8. A decided increase in the possibility of maternal nursing. At least 80 per cent of the infants dying under one year of age are artificially fed.

9. A great reduction in maternal mortality and morbidity. In 1913, in the United States, at least 15,000 women died from conditions incident to childbirth; 7,000 of these from puerperal sepsis, and 8,000 from largely preventable diseases.

10. Greater peace of mind to the more or less harassed mother.

11. A reduction in the number of cases of ophthalmia neonatorum.

12. The elimination of the mid-wife. DeLee says, "The science of obstetrics is far in advance of the art."



13. The placing of obstetrics on a basis such that the physician is able to charge and the patient is willing to pay a respectable fee.

14. Elevation of the standard of obstetrics.

The value of the new-born to the nation is being emphasized abroad today a thousand fold. The leading French cities afford practically all pregnant women prenatal care and hospital delivery. Financial support is given before and after confinement. The Australian government gives every woman 5 pounds, and England gives every insured father and mother \$7.50 each on the birth of a child. In Germany, maternity benefits have been increased three times since the beginning of the war, and among other things now consist of \$59.50 for confinement expenses and other financial support following delivery. This war has focused attention on the infant; the combatting of obstetrical mortality has become most properly a war measure.

C. D. HOLMES.

**Applegate, J. C.: Birth Injuries.** *N. York M. J.*, 1919, cix, 626.

Particular attention is called to the injuries to the child while it is in transit, and a series of measures is suggested which tend to limit the amount and degree of such injury when there is disproportion between the size of the foetus and the diameters of the pelvis.

When in a case of pelvic contraction the conjugata vera are 1 to 1½ cms. below normal or the foetal head is slightly above normal, the time for the immediate application of the forceps is indicated by exhaustion of the mother, oedema, dilatation of the cervix, rupture of the membranes, persistent contractions, and no progress. As long as the membranes are intact the child does not suffer, but when they have ruptured a warning is given by the liquid amnii discolored by meconium and the slowing of the foetal heart which is followed by a weak, rapid, and irregular beat due to threatened or actual paralysis from compression. When rupture of the membranes has not occurred after long-continued contractions, the result is intracranial trauma; when the membranes have ruptured there may be asphyxia from placental compression.

To minimize the traumatism in cases of disproportion between the foetus and the diameters of the pelvis there are four courses which may be pursued:

1. The elimination of fats and carbohydrates from the diet of the mother during the last six weeks of pregnancy to retard the full or over-development of the foetus. In such cases the child will be from 1 to 2 pounds lighter and none the worse for it.

2. The induction of labor ten or twelve days before term before much disproportion has been reached.

3. In cases of contracted pelvis and small foetal head the application of the test of labor followed by instrumental delivery if necessary.

4. The test of labor at term and emergency caesarean section without instrumental interference when

in doubt, and elective caesarean section when there is no doubt, as to the possibility of delivery by the natural route.

The author believes that the greater number of cranial injuries occur from the application of forceps to the head in a faulty position. For this reason when there is doubt he advises that the position of the head be ascertained by the introduction of the gloved hand. Protracted labor does greater harm to the child in transit than the use of the forceps properly applied.

C. D. HOLMES.

**Tonina, T. A.: Infantile Eclampsia and Star Anise** (La eclampsia infantil y el anis estrellado). *Semana med.*, 1919, xxvi, 167.

The eclamptic or convulsive states in the infant are divisible into two groups, spasmophilic and non-spasmophilic. The first is due to a spasm diathesis, while the second has a varied origin, cerebral, meningeal, toxic, infectious, etc.

Since 1916 the author has observed a number of cases of eclampsia in children in Buenos Aires the origin of which he traces to the use of star anise (*illicium anisatum verum*) which was given as a carminative by the mothers.

The general syndrome is that presented by acute dilatation of the stomach and intestines and paralytic gastro-intestinal ileus.

W. A. BRENNAN.

**Sanjuan, P. D.: Remarks upon the Heredity of Leprosy** (Consideraciones sobre la herencia de la lepra). *Rev. de obst. y ginec.*, 1919, iii, 3.

The conclusion reached at the last International Conference on Leprosy (1910) was that while the congenital transmission of leprosy (intrauterine leprosy) is theoretically possible, it has not been demonstrated clinically.

The author examined the placenta of two young children of leprous mothers. Macroscopically they were normal, but on microscopic examination certain alterations were observed in the arterial vessels. In these areas, cells of decidual origin were found from which it was possible to obtain Hansen's bacillus in large numbers.

The author does not believe in the direct transmission of leprosy — in transmission of the germ ab ovo, but he considers that intra-uterine contagion is possible and that the lesions observed in the examined placenta gave evidence of it.

He therefore advises that the offspring of leprous mothers should be considered as temporarily leprous. Immediately after birth, therefore, they should be separated from the mothers and, while not confined as lepers, should be kept in certain houses in which they can be watched as cases of suspected leprosy.

W. A. BRENNAN.

**Amritaraj, S.: Need for State Legislation to Control Untrained Practising Midwives in India.** *Madras M. J.*, 1919, ii, 4.

In every city, town, and village, there have been always what are called "barber midwives" or



"dhais," who are the cause of much trouble. These women know the practice of midwifery after a fashion of their own and are in great demand among the poorer people of the community. To them, sepsis and the methods of managing difficult cases of labor, the two essential principles of scientific midwifery, are unknown. Added to this fact is the unsanitary condition of the houses in which such labors are conducted.

Indian women should be educated in sanitary matters, especially with regard to the hygiene of the parturient woman and of infants, and it is the duty of the men to promote this. Social reform should be primarily in this direction.

Very few Indian women will permit male doctors to attend them during labor.

The poorer classes cannot afford to pay for good qualified midwives, and therefore the untrained midwife gets the upper hand.

There is an inherent unwillingness in the great majority of Indian women, even of the poorer sections, to enter the public maternity hospitals.

A very large number of villages are not as yet provided with qualified (western) midwives. Here quackery reigns supreme and every old woman pretends to be physician and accoucheuse.

The importance of a supervising agency should be considered if success is to be attained.

It is very difficult to secure statistical figures regarding the number of deaths of women and infants actually due to postpuerperal conditions. A good number of such deaths now attributed to child-birth, are due to careless midwifery. A large number recorded in hospital statistics as due to puerperal septicæmia are often the result of interference by untrained midwives before the patients were taken to the hospitals.

Legislative measures proposed are as follows:

1. Compulsory registration and licensing of all women practising midwifery, a penalty to be imposed for noncompliance.

2. Compulsory training of all unqualified dhais (barber midwives) for a definite period (at least three months) in recognized maternity hospitals, so that they could be brought under Section 1 of these recommendations.

3. The imposing of the following general conditions on registered midwives before licenses to practice midwifery are granted:

(a) Every qualified midwife or dhai practicing midwifery shall be registered and shall take out a license.

(b) Every child-birth conducted by her shall be reported within twenty-four hours.

(c) Every such midwife or dhai shall conduct labor in as cleanly a manner as possible and shall take all precautions necessary for the welfare and safety of the mother and the new-born infant.

(d) Every child delivered alive shall have its eyes washed with a 10 per cent solution of boracic acid (or other solutions to be selected) immediately after its birth.

(e) When difficult labor is anticipated, or as soon as signs of such a condition are noticed, the midwife or dhai in attendance shall advise the householder either to send the patient to a maternity hospital or to seek the advice of a medical practitioner.

(f) The administrative officer shall have the power to send any officer to visit any or all of the women in confinement whenever necessary.

(g) The midwife or dhai shall report to the administrative officer of the locality any unsanitary conditions noticed in the house or houses where she has been in attendance.

(h) Every midwife or dhai shall provide herself with a standard outfit consisting of the following articles: enema set, douche set, dressing forceps, dressing scissors, cotton, wool and lint, crochet thread for ligaturing the cord, soap, nail-brush and basin, potassium permanganate for lotion to clean hands, a little boric powder for dusting, pure vaseline, a clinical thermometer, and a wooden stethoscope.

The civil and military station of Bangalore was one of the earliest to appoint a woman health visitor, and she has been found to be a most useful assistant in the health department. Her main duties consist in supervising six municipal midwives and the municipal crèche for the children of the mothers of the working classes.

The following table shows the results obtained:

Official Years Apr. 1 to Mar. 31	Ratio of Deaths per 1,000 Births	Remarks
1905-1906	418.67	
1906-1907	345.42	
1907-1908	302.33	
1908-1909	340.12	
1909-1910	353.48	
1910-1911	320.30	Two municipal midwives first appointed.
1911-1912	267.83	
1912-1913	332.92	Six municipal midwives working. For the past two years they have been under the direction of a European woman health visitor.
1913-1914	233.48	
1914-1915	232.35	
1915-1916	225.25	
1916-1917	243.28	
1917-1918	276.3	

EDWARD L. CORNELL.

#### Ammal, S. M.: A Word About Midwives. *Madras M. J.*, 1919, ii, 22.

The author has often felt in the course of her practice that the Indian midwives are not properly trained and sufficiently equipped for their work. When called upon to attend a case of labor they are totally ignorant of the elementary things which will be needed for its successful management.

The trained nurses do not equip themselves properly for aseptic midwifery. They seldom carry a bag and are totally ignorant of asepsis. They do not have a nail-brush, lysol, or sterilized wool. Many of them, to save the trouble of washing their hands, make vaginal examinations with castor oil. They

never palpate but without hesitation make an examination by the vagina even though they see the head actually coming through. They believe that a vaginal examination during labor is an absolute necessity. Some of the midwives who were trained according to the old school never fail to administer a vaginal douche after labor and continue to do so until the tenth or eleventh day. When giving the vaginal douche they do not sterilize the nozzle, but simply wash it with hot water.

The various hospitals where the midwives are trained should see that they are properly equipped for aseptic midwifery before they grant them the diploma. More attention should be paid to the practical side of their work. Indian midwives are accessible to the poor and middle class people as their fees are low. They should be compelled to attend the large maternity hospitals for a period of time at least once in four years and should be required to pass an examination.

EDWARD L. CORNELL.

**Fairbairn, J. S.:** *The Teaching of Obstetrics and Gynecology from the Standpoint of Preventive Medicine.* *Proc. Roy. Soc. Med.*, Lond., 1919, xii, 40.

The gist of the author's argument is that the medical profession must acknowledge their especial

responsibility to create an atmosphere of preventive medicine in their teaching. For this purpose every medical school should be provided with a complete maternity and child-welfare center. By co-operation with the pediatric side, instruction covering a period of six months should be continued from midwifery into child welfare. In this way, while acquiring the practice of obstetrics, gynecology, and pediatrics, the student would be made to feel that he is playing at least a minor part in a scheme of preventive medicine the complete working of which he can visualize.

As the study of obstetrics and gynecology brings to the student "new applications of his clinical experiences, new social relationships," it is necessary not only to teach him the actual practice of these subjects but also to give him a wider outlook.

He should be taught to apply his professional knowledge toward increasing the resistance of the normal person to disease and arresting the progress of incipient disease. Thus the whole standard of the health and physique of the nation's mothers and children will be raised. Such instruction involves a fuller consideration of the social, the psychologic, and other factors affecting the life and well-being of the individual patient and the community as a whole.

EDWARD L. CORNELL.



# GENITO-URINARY SURGERY

## KIDNEY AND URETER

**Bejarana, J.: Infantile Pyelitis in Bogota** (Apuntes sobre la pielitis infantil en Bogotá). *Rep. de med. y cirug.*, 1919, x, 293.

Pyelitis in children is often masked by the condition causing it which most frequently is a gastrointestinal infection due usually to the colon bacillus.

In addition to pyuria, the most suggestive signs of the condition are polyuria and a milky appearance of the urine. If pain is felt constantly or is elicited in the costovertebral angle and at Bazy's point, the ureter also is probably involved. In the author's cases there was always slight œdema of the legs.

Pyelitis in children is frequent in Bogota where in some instances it follows an infection such as typhoid, pneumonia, or scarlet fever. In all of the author's cases and all others that he knows of, the patients were girls ranging in age from 6 months to 7 years.

A long time is necessary to effect a cure as usually the condition seems to be of a recurrent type. In the author's opinion vaccine and serum treatment might be of value.

W. A. BRENNAN.

## BLADDER, URETHRA, AND PENIS

**Folch: Retrovesical Hydatid Cyst** (Un caso de quiste hidatídico retrovesical). *Med. Ibero.*, 1919, vi, 260.

The patient was a man 52 years of age. Rectal exploration and palpation disclosed the presence of a tumor behind the symphysis pubis. From the clinical findings and the fact that hydatid cells were found in the evacuations, a diagnosis of retrovesical hydatid cyst was made.

A median laparotomy was done, but complete extirpation of the cyst was not possible, owing to its intimate adhesion to the rectum. It was therefore emptied and marsupialized. There was no fistula between the cyst and the rectum.

The case shows that a hydatid cyst may have its origin elsewhere than along the main blood and lymph channels.

W. A. BRENNAN.

**Beck, C.: Multiple Papillomata of Bladder.** *Surg. Clin. Chicago*, 1919, iii, 271.

The author reports the case of a woman 59 years old who suffered for many years with frequent and painful urination and the sensation of incomplete evacuation of the bladder. At times the urine contained a considerable amount of blood. Bimanual palpation through the vagina and abdominal wall indicated that the bladder contained a large irregular mass which was not particularly sensi-

tive, not very hard, and somewhat movable. The patient had lost some weight, but was not cachectic.

The probable diagnosis was papilloma of the bladder, possibly carcinoma or stone. An exploration, which was the only means of making a definite diagnosis and effecting a possible cure, was performed with the patient in the Trendelenburg position. As soon as the bladder was opened numerous round projections the size of large walnuts were seen clustered like the heads of several cauliflowers on the front wall of the bladder. Two of them which were close to the bottom, near the trigonum, overlapped the urethral opening. Owing to the deposit of phosphatic material, these tumors were grayish in appearance. They were raised out of the bladder as far as possible and the bladder mucosa incised down to the submucosa. The papillomata were then ligated off with silk thread en masse, and the silk thread left long enough to hang out of the bladder. A catheter was then placed in the urethra and the wound above not sutured at all, but left wide open.

The patient made a good, although slow, recovery. The only disagreeable feature of the after-treatment was the tremendous amount of phosphate deposited on the threads and the abdominal wall.

Finally it was possible to make a secondary suture of the bladder but not before the large sloughs with the sutures came away leaving granulating wounds. At the time of the report the patient was gaining and free from symptoms, but small calculi of phosphates still tended to form and were occasionally washed out.

B. S. BARRINGER.

**Corbiveau: Plastic Indurations of the Corpora Cavernosa** (Indurations plastiques des corps caverneux). *J. d'uroł. méd. et chir.*, 1919, vii, 543.

Plastic induration of the corpora cavernosa is known under a variety of names: sclerosis, plastic concretions, fibrous tumors of the penis, etc. The author gives a historical sketch of the contributions to the study of the condition which have been published from the time it was first described by La Peyronie in 1743 up to 1916. One hundred and eighty-nine cases collected from literature are tabulated.

The most frequent site of induration is the anterior third of the penis. It is difficult to classify the various causes to which these indurations have been attributed. The condition may be due to (1) inflammation, (2) syphilis, (3) trauma, and (4) a constitutional condition such as gout, rheumatism, or tuberculosis. In some instances no cause can be assigned. The author discusses each of these classes of cases at length and concludes that there is no well-defined etiology, the induration being the result of a variety of causes.



The largest percentage of cases occur in those who have diabetes, gout, or gonorrhœa. The indurations may be single or multiple and appear as nodules, plaques, or bands which are developed at the expense of the fibrous capsule of the corpora cavernosa. Histologic examination has shown them to consist of fibrous connective tissue, or due to fibrous degeneration of the sheath. In a few cases calcareous incrustations have been found.

Apart from pain, the most important clinical effect is curvature of the penis and the resulting interference with its function. The condition may simulate malignant, benign syphilitic, or tuberculous tumors and indurations.

As medical treatment rarely gives good results, resort must be had to surgery. Although in 1885 Tuffier stated that surgical treatment is impracticable on account of the hæmorrhage which results from extensive extirpations, many successful operations have been performed. According to the most recent opinions, however, surgery should be used only when the disability is so great as to demand it and when the induration is complete. Possibly also radium may be of value.

W. A. BRENNAN.

#### GENITAL ORGANS

**Herbst, R. H.: Vasotomy in a Case of Persistent Seminal Vesiculitis.** *Surg. Clin. Chicago*, 1919, iii, 473.

The patient, who was 27 years old, had had gonorrhœal infection twice. At the time of examination his complaint was swelling and tenderness of the right testicle. Six years ago he had a Neisserian infection which lasted for six weeks and cleared up without involvement of the epididymis. Three years ago he had a second infection lasting six to seven weeks but not associated with testicular swelling. At the end of that time he had a morning drop. One month after the disappearance of the discharge (three years ago) the right epididymis became swollen following massage of the prostate and the passage of a sound. The right testicle was swollen to the size of a clenched fist, and the patient's temperature was 102° F. Following excesses, the discharge was increased. Two weeks ago a swelling was noticed in the right spermatic cord, and on the following day a swelling in the right epididymis. This swelling had persisted.

On examination the right testicle was found to be swollen to twice the size of the left. Most of the swelling was in the epididymis. Palpation in the rectum revealed a slight enlargement of the prostate, and the fact that both seminal vesicles were extremely large and hard. The patient was placed in bed with the scrotum elevated by a sling and covered with a compress moistened with a saturated solution of magnesium sulphate. The swelling in the epididymis has rapidly disappeared.

In the author's opinion the only way to clean up

such an infection permanently is to perform a bilateral vasotomy. He picks up the cord and where it comes out of the external ring injects around it a few cubic centimeters of a ½ per cent solution of apothesine, infiltrating also the skin of the antero-lateral wall of the scrotum. An incision is then made along this line about 1½ inches in length through the dartos, exposing the cord. The vas is isolated and a small longitudinal incision made into its lumen through which a strand of silk-worm-gut is then sutured. Withdrawing the silk-worm-gut, he introduces the point of a syringe into the vas and injects a 3 per cent solution of collargol, filling the vesicle. The vas is kept out of the scrotum for a few minutes to prevent the return of a small quantity of the collargol, which would produce painful swelling, and then dropped back and the sheath closed with one catgut suture. Some of the solution remains in the vesicle from a week to a month.

B. S. BARRINGER.

**Coley, W. B.: Operative Treatment of Undescended or Mal-Descended Testis, with Special Reference to End-Results. Report of 415 Cases.** *Surg., Gynec., & Obst.*, 1919, xxviii, 452.

With regard to the frequency of undescended testis, the statistics of the Hospital for Ruptured and Crippled covering the period from 1890 to 1918 show 80,736 cases of inguinal hernia in male adults and children of which 1,357 (1.68 per cent) were associated with undescended testes. The same statistics show that 4,453 male patients were operated upon for inguinal hernia and of these 334 (7.5 per cent) had also undescended testes. The latter figures deal almost entirely with children under 15 years of age. Of 1,040 cases of inguinal hernia in male adults operated upon at the Memorial Hospital by Dr. William A. Downes and the author, the hernia was associated with undescended testis in 49 (4.71 per cent).

With regard to the etiology Coley believes that the theory so strongly advocated by Buedinger and others that a mechanical obstruction of some sort, due to adhesions of inflammatory origin during foetal life, is the principal cause, has little pathologic or operative evidence to support it.

Reference is made to Uffreduzzi's exhaustive study of the pathology of the undescended testis based upon the extensive material of Carle's Clinic at Turin and his conclusion that the undescended testis is often associated with other developmental anomalies in which heredity frequently plays an important rôle. Uffreduzzi examined 100 patients at the Morro Institute for the Insane and among these found an ectopic testicle in 18 (6 bilateral and 12 unilateral). The author's own observations showed that in the great majority of cases of unilateral ectopic testicle other signs of degeneration or developmental anomalies were rarely present but were occasionally found in cases of double undescended testis.

The principal changes noted in the pathology of the undescended testis were thickening of the tunica albuginea and basement membrane of the tubules



and a great increase in the interstitial cells. The epithelial lining of the tubules also showed very marked changes, the epithelial cells being few in number and more or less degenerated and irregular in shape.

The author agrees with Uffreduzzi that a considerable portion of the undescended testis, probably 10 per cent. retains the power of spermatogenesis. Another and very important reason for not sacrificing the testicle, especially in children, is the presence of the interstitial cells which have an important influence in developing the child's male characteristics.

For a century or more it has been held that the undescended testis is more prone to the development of malignant disease than the normal testis. More recent writers have expressed doubt as to the correctness of this view. In the author's opinion a careful study of the relative frequency of sarcoma in both types will prove that the undescended testis is considerably more frequently the seat of a malignant tumor than the normal testis. In 64 cases of sarcoma of the testis observed by him, the sarcoma occurred in the undescended testis in 12, a proportion of 1 to 5½, whereas the relative proportion of undescended to normal testes is about 1 to 50.

From Jan. 1, 1890 to Jan. 1, 1918, 334 patients with undescended testes were operated upon at the Hospital for Ruptured and Crippled and since that time there have been 31 additional cases. Adding to these 50 cases of operation at the Memorial Hospital and at Bull's Hospital, we have a total of 415 cases.

As regards the final results: in 49 cases the testis was found in the vicinity of the external ring just above the pubic bone; in 17 cases, in the upper scrotum; and in 4 cases, in the mid-scrotum. In 16 cases it was impossible to locate it in any position, probably because it had retracted into the abdominal cavity or had become too atrophied for palpation.

The ages of the patients as far as known were as follows: Under five years, 33; five to ten years, 160; ten to fifteen years, 133; fifteen to twenty years, 29; twenty to thirty years, 16; thirty to forty years, 7; forty to fifty years, 5; and over fifty years, 1.

The final results as far as could be traced in the cases observed at the Hospital for Ruptured and Crippled were as follows:

Well	Number of Cases
More than 20 years later .....	1
10 to 20 years later .....	16
5 to 10 " " .....	41
2 to 5 " " .....	60
1 to 2 " " .....	31
6 months to 1 year later .....	21
Less than 6 months .....	15
Not traced .....	149

One case to which special reference is made in the discussion of the final results was that of a double undescended testis which was operated upon on the left side in 1895. The patient was married in 1902,

a child was born in 1903, and in 1910 the patient was operated upon for the undescended testis of the right side.

There were no deaths in the entire series of cases and no serious sequelæ or recurrence of the hernia.

The author refers to the different types of undescended testis, pointing out the frequency of the inguinoperforal variety, of which the statistics of the Hospital for the Ruptured and Crippled since 1890 show 77 cases. In this type the testis, after emerging from the external ring, passes upward and rests directly upon the aponeurosis of the external oblique, in some instances as far up as the anterior-superior spine. In practically all cases, with two or three exceptions, the ectopic testis was found associated with inguinal hernia, although in most instances with a potential, rather than an actual, hernia, the tunica vaginalis connecting with the abdominal cavity.

The method of operation employed was the Bassini method without transplantation of the cord. The main points in the technique to be emphasized are very high ligation of the sac with removal of all fascial bands and the closure of the lower end of the tunica vaginalis over the testis by means of a purse-string suture. In most instances these steps made it possible to bring the testis down into the scrotum. In a certain number of cases, particularly in the abdominal variety of ectopia, it may be necessary to adopt the valuable suggestion of Bevan, i. e., remove most of the veins of the cord except the vas and the artery. In the earlier cases Coley often sutured the testicle to the scrotum but later abandoned this step as unnecessary.

Some of Coley's more important conclusions are as follows:

1. In most cases of undescended or mal-descended testis the etiology points to a congenital origin, often influenced by the element of heredity and frequently associated — particularly in the double variety — with other developmental defects.

2. While the question of the functional value of the undescended testis cannot be definitely answered in an individual case, it is probable that in a considerable number of cases, at least 10 per cent, the testis retains the power of spermatogenesis.

3. The testis should rarely be sacrificed, especially in children, for two reasons: (1) Because of its possible functional value; and (2) because of the interstitial cells which are present in all cases and which have an important influence on the development of the child's male characteristics.

4. The tendency to malignant disease is considerably greater in the undescended than in the normal testis.

5. Operation should be advocated in children who have reached the age of 8 or 10 years, for the following reasons: (1) the radical cure of the hernia with which the undescended testis is practically always associated and which often cannot be controlled with a truss without causing pain and irritation, and (2) by bringing the testis down into

the scrotum at this period there is a possibility of causing its further and more normal development.

6. Operation in adults over the age of 14 should be even more strongly urged for the following reasons: (1) To cure the accompanying hernia; (2) to place the testis in a position in which it is much less liable to trauma and therefore to malignant degeneration; and (3) for the mental and moral effect upon the patient.

#### MISCELLANEOUS

**Ratelier: The Treatment of Bubos by Filiform Drainage** (Traitement des bubons par le drainage filiforme). *Arch. de méd. et pharm. nav.*, 1919, cvii, 271.

The author's method of treating venereal bubos is to make a small incision in the skin and cellular tissue at the most fluctuating point, introduce a pointed stylet, and rupture the ganglionic envelope until pus is seen to escape. A second orifice is then made at some distance from the first in the envelope beneath the skin. Thick strands of silk are next introduced and the ends knotted without traction. The dressing applied consists of cotton wool soaked in permanganate solution. The threads are not removed until the suppuration and swelling have disappeared and there is no longer any pain on pressure. Each ganglion is treated separately in the same way.

W. A. BRENNAN.

**Aragao, H. de B.: The Bacterium of "Granuloma Venerium"** (Sobre o microbio do "granuloma venerium"). *Brazil-med.*, 1919, xxxii, 74.

In 1912, in collaboration with Vianna, the author made investigations to verify the findings of Donovan in regard to the presence of certain organisms in granuloma venerium. These studies were published in the Memoirs of the Oswaldo Cruz Institute. Since then, further investigations have been made and the results summed up as follows:

1. The true bacterial cause of granuloma is the bacterium found by Donovan in 1905 and verified in 1912 by Aragão and Vianna who, on the basis of its morphology, reactions, mode of reproduction, and parasitism, gave it the name "Kalymmato-bacterium granulomatis."

2. The Kalymmato-bacterium granulomatis has never been cultivated.

3. The bacteria which the author sometimes obtained in cultures from cases of granuloma venerium were never identical with those found in granulomatous tissues or within the cells. The cultivated bacteria belonged to the group of encapsulated organisms of the type of Friedländer's pneumobacillus, capsulatus, mucosus, etc., which are commonly present in the body and never cause lesions similar to those produced by Kalymmato-bacterium granulomatis.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Becco, R.: Frontal Mucocoele** (Mucocoele frontal). *Semana med.*, 1919, xxvi, 341.

Becco reports a case of frontal mucocoele in a woman aged 65 years. The tumor pushed the left eye outward and downward. An exploratory puncture and analysis of the withdrawn contents having led to the diagnosis of mucocoele, an Ogston-Luc operation was decided upon. The frontal sinus was found to be obstructed on its anterior surface at the internal third of the supra-orbital arch, a condition which necessitated the removal of a small portion of the arch. The patient made an easy recovery.

As chronic inflammation of the maxillary sinus is more frequent than inflammation of the frontal sinus, it would appear that mucocoele of the former would be more frequent than mucocoele of the frontal sinus. The opposite, however, is true, a fact for which Becco is unable to offer any explanation.

W. A. BRENNAN.

**Fresno, F. P. del: Slight Modifications of von Graefe's Method of Extracting Cataract in the Capsule** (Pequeñas modificaciones del metodo de von Graefe para la extraccion de la catarata en la capsula). *Prog. de los clin.* 1919, vii, 117.

The author reviews the present-day methods of effecting the intracapsular extraction of cataract. The difficulties of Smith's technique have given origin to a number of modifications and to other intracapsular methods which avoid its difficulties. The suction method of Barraquer is based on that of Hulen, the mechanics of which it improves.

The modifications in the intracapsular method devised by Knapp, Stanculeanu, Török and Kearney are slight but advantageous changes in the von Graefe method. They increase the benefits of the intracapsular extraction without causing any inconveniences, and the loss of vitreous fluid is less. The use of the Kalt forceps is ideal for the extraction of the transparent crystalline lens as

well as of cataracts which are mature, supermature, and nuclear. For cataracts in the period of swelling the suction method of Hulen is indicated.

W. A. BRENNAN.

## EAR

**Steinleger, M.: Mastoiditis in Early Infancy without Otorrhœa** (Mastoiditis de la primera infancia sin otorrea). *Rev. méd. de Rosario*, 1919, xi, 29.

During a practice of three years' time in pediatric surgery the author has treated 35 cases of mastoiditis in 9 of which the condition occurred in children under 2 years of age. It has been considered that mastoiditis is rare during the first years of life but the proportion of 9 cases in 35 indicates that the contrary is true.

The mastoiditis of early infancy has a peculiar character of its own which differentiates it from that of older children and adults, i. e., it appears to be unaccompanied by a lesion of the middle ear. The affection in young children is relatively benign. Of the 9 patients, only 2 had had a prior otorrhœa, the tympanic membrane in the remaining 7 being intact. A radical operation was done in all cases and followed by recovery.

W. A. BRENNAN.

**Emerson, F. P.: Changing Methods and Advances in the Treatment of Progressive Deafness Following Chronic Hyperplastic Otitis Media** *Ann. Otol., Rhinol. & Laryngol.*, 1919, xxvii, 1250.

Emerson concludes from a careful analysis of the pathology and the resultant impairment in function which is characteristic of this class of cases, that the deafness is caused by the transmission of toxins from foci of infection through the blood and lymph streams. On this assumption that focal infections are the basic etiologic factor in deafness, he asks that more attention be paid to their removal than to ordinary methods of treatment which are directed against the end-products of the infections in the nasal accessory sinuses, tonsils, teeth or more remote parts such as the gastro-intestinal tract.

J. J. HOMPES.

# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**DeMuth, J. S.: Diagnosis of Disease of the Accessory Sinuses.** *Pennsylvania M. J.*, 1919, xxii, 430.

This is a practical paper filled with useful aphorisms a few of which are the following:

1. We are seeking the royal road. There is but one master key to unlock the secrets of accessory sinus disease and that is clinical experience.

2. Instruments of precision are of value only when read by a precise man.

3. There are practically no symptoms peculiar to any one sinus that may not at the same time apply to any other.

4. If the membranes in the middle meatus do not contract after application of cocaine and adrenalin, it is almost pathognomonic of ethmoiditis.

5. We commonly approach our cases expecting to find too much written in large letters and overlooking the footnote written in obscure subjective symptoms.

6. If there are any pathognomonic symptoms of sinusitis you are as likely to find them below the soft palate as above it.

7. Transillumination is helpful only to confirm a suspicion.

8. Suction is helpful only when it produces a positive result.

9. The diagnosis of sinus disease is possible only to one thoroughly familiar with that intricate group of cavities.

10. An exhaustive history compiled with a most thorough and repeated rhinological examination continues to be the foundation of our clinical diagnosis.

O. M. ROTT.

**Turner, H. H.: Ocular Evidences of Pathology of the Ethmoidal Labyrinth.** *Pennsylvania M. J.*, 1919, xxii, 427.

Turner discusses the minor primary ocular manifestations of ethmoiditis. The objective evidences mentioned are:

1. Fullness of the vessels of the bulbar conjunctiva.

2. A considerable reduction in the convergence power of the eyes.

3. Fundus changes such as (a) fullness and tortuosity of the retinal veins in chronic ethmoiditis and of both the arteries and veins when the infection is acute; (b) partial or complete pigment rings about the discs; and (c) granular fundi with massing of the choroidal pigment.

4. In some children a progressive rapid elongation of the eyeball with a corresponding change in the dioptric status toward the myopic status.

5. Various types of opacity in the lens and corneal stroma of the same side as the sinus disease.

The subjective symptoms are: (1) Recurrent headache; (2) a marked sense of heaviness and soreness about the eyes; and (3) troublesome hyperæsthesia with ocular asthænia, the latter usually muscular.

O. M. ROTT.

**Maybaum, J. L.: Hyperplastic Ethmoiditis, Diagnosis and Treatment.** *N. York State J. Med.*, 1919, xix, 122.

Hyperplastic ethmoiditis results from continued irritation of the nasal mucous membrane without infection. When infection occurs, suppurative ethmoiditis results.

The symptoms are usually characteristic. A thickened membrane on the outer wall of the middle turbinate and the floor of the ethmoid capsule may be the first objective sign of the presence of the condition. In such cases the middle turbinate should be resected.

Simple hyperplastic ethmoiditis may never show signs of pus formation throughout its course and purulent ethmoiditis may never give rise to polyp-formation. The presence of pus during the course of hyperplastic ethmoiditis is due to irritation and secondary infection.

Opening into the ethmoid is indicated when signs of hyperplastic ethmoiditis are associated with subjective symptoms.

The Mosher operation is the ideal method of exenterating the ethmoid cells. A thorough knowledge of the anatomic relations and pathologic conditions present is essential.

O. M. ROTT.

## MOUTH

**Francis, H. R.: Nitrous Oxide-Oxygen Anæsthesia for Difficult Extractions.** *Am. J. Surg.*, 1919, xxxiii, 56.

The majority of extraction cases being of the nature of emergency operations, the surgeon is often called upon to administer anæsthetics without any previous preparation of the patient. He is therefore forced to rely wholly upon the anæsthetic agent, supplemented as far as possible by suggestion and his skill as an anæsthetist.

In nitrous oxide-oxygen is found an agent which fulfills the requirements of such cases. Being practically non-toxic and non-irritating, it is possible to administer it with comparative safety to patients without increasing the existing pathological conditions. It is the safest and most flexible anæsthetic in the hands of the skilled operator, and history has shown that nitrous oxide alone is remarkably safe even when employed by the inexperienced.



The essential requirements in the administration of nitrous oxide-oxygen anæsthesia consist in the ability of the anæsthetist to determine the proper mixture of the gases and diagnose the various planes of anæsthesia, and in the employment of a machine capable of developing the possibilities of this type of narcosis.

In the majority of cases anæsthesia will be maintained with about 93 per cent of nitrous oxide and 7 per cent of oxygen. There is no set rule however. A few inhalations one way or the other restore consciousness or plunge the patient into a condition of collapse, a fact which explains the necessity for a refined technique.

M. N. FEDERSPIEL.

**Smith, A. L.: Dental Infections in Children.** *Arch. Pediat.*, 1919, xxxvi, 148.

Smith reports his observations in 100 cases of peridental infections in the mouths of children from 1½ to 2½ years of age.

The affected tooth area was isolated from the rest of the mouth, dried with alcohol and ether, and painted with one-half strength tincture of iodine. The root of the tooth, whether whole or partly absorbed, was touched with nothing except the sterile instruments used in inoculating the culture media. The inoculated tube was examined each day and not discarded before the sixth day of incubation at 37 degrees centigrade. It was then placed before a window to assist in pigment development. Stained smears were made from the apical region of the tooth; in addition, wet preparations were examined immediately to obtain data on the motility of the organisms. The media used in these experiments were Loeffler's blood serum, plain agar, litmus lactose and dextrose agar, ascitic agar, blood agar, and beef bouillon with hen hæmoglobin.

All of the strains of streptococci recovered, 48 in number, were injected intravenously into young

rabbits to ascertain the pathogenicity and localizing power of each. The dose consisted of the organisms present in 5 cc. of dextrose bouillon incubated at 37 degrees centigrade for twenty-four hours. These were twice washed in normal salt solution, put into 2 cc. of the same solution, shaken thirty minutes, strained through eight layers of fine gauze, warmed, and injected slowly into the marginal ear vein of the rabbit. The rabbit was killed and the autopsy performed when the animal seemed to be infected.

The following table shows the organisms and their number found in the 109 cases:

1	Streptococcus hæmolyticus.....	27
2.	Streptococcus pyogenes.....	19
3.	Streptococcus viridans.....	2
4.	Staphylococcus pyogenes citreus.....	9
5.	Staphylococcus pyogenes aureus.....	37
6.	Staphylococcus pyogenes albus.....	7
7.	Bacillus pyocyaneus.....	1
8.	Diplococcus pneumoniae.....	18
9.	Micrococcus catarrhalis.....	4
10.	Bacillus fusiformis (Vincent's angina)....	1
11.	Diphtheroid bacillus.....	3
12.	Sterile.....	8

All of the streptococci were injected into rabbits with the hope of finding that they had a selective action upon the dental tissues, but in no case was this true. In the 48 rabbits into which the injections were made the kidneys showed multiple abscesses in five instances, the cardiac muscle in one, the brain tissue in one, and the joints in four. In each case the streptococcus was recovered. Therefore, in this series of 48 there were 11 metastatic infections causing pathologic lesions far removed from the original focus. This is such a high percentage that dental infections in children cannot be regarded lightly.

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# INTERNATIONAL ABSTRACT OF SURGERY

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## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Chevrier, L.: Studies on the Cholæmia Following Anæsthesia and Methods of Modifying It.** (Etude sur la cholémie post-anesthésique et sur les moyens de la modifier). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 735.

Since 1909 Chevrier has been engaged in the study of the effects upon the body of general anæsthetics. Patients were selected for this investigation who were as far as possible free from infection or other taint, and blood examinations were made before and at frequent intervals after anæsthesia.

In 74 cases in which chloroform was the anæsthetic used, cholæmia was found in all. This cholæmia was immediate and therefore may be termed a "cholæmia of inhalation" or "primary cholæmia."

Cholæmia was a constant finding also after ether anæsthesia, having occurred in all of 38 tested cases. This fact the author believes is more remarkable than the appearance of the condition after choloroform anæsthesia for even a slight icterus is not observed after ether while it is frequently observed after the use of chloroform.

The author has made a number of investigations also upon the effects of certain substances in modifying the cholæmia following anæsthesia. Sugar, lipid extracts, liver extracts, morphine, and combinations of these agents were tried in succession. The substance was administered by mouth or by subcutaneous injection before anæsthesia. The results obtained in each series of cases are given in tabular form.

In Chevrier's opinion, cholæmia following anæsthesia may have either a hepatic or a hæmic origin. The hæmolytic action of the anæsthetic would accord very well with the onset of cholæmia. Numerous observations have demonstrated to Chevrier unquestionably, however, that hæmolyzed blood alone does not give the reaction of the bile pigments. It is necessary not only that the blood

be hæmolyzed but also that the dissolved hæmoglobin be transformed. Hæmolysis is instantaneous, but pigmental change is not. Therefore, as cholæmia is immediate, Chevrier believes that the part played by hæmolysis in cholæmia is slight.

Clinical findings, experimental and anatomopathologic research, and all therapeutic tests indicate that the main cause of cholæmia following anæsthesia is some injury from the anæsthetic to the liver. While the suddenness of the onset of cholæmia speaks rather against an attack of the anæsthetic upon the liver, Chevrier believes that such injury does occur and is produced in two stages. The first stage corresponds to the chloroform-inhalation cholæmia, i. e., the primary cholæmia. In this stage there is no cytologic lesion, only a vasomotor disturbance, hepatic congestion, and a disturbance of the osmotic equilibrium of the hepatic cells. Succeeding this stage is a cyto-hepato-toxic condition due to retention of the anæsthetic. If the hepatic cells are already injured, the state of cholæmia may be surpassed and a mild icterus may result. If the hepatic cells are hypersensitive or strongly permeated by the anæsthetic, the icterus may be severe. The greater the delay in the elimination of the anæsthetic, the greater the possibility of icterus. This explains why similar conditions do not appear after ether, the complete elimination of which is much more rapid than the elimination of chloroform.

Hepatic cholæmia may be described briefly as a primary cholæmia due to hepatic congestion with cellular depolarization and perhaps hæmolysis. Secondary cholæmia is due to cyto-hepato-toxic lesions with the presence of transformed pigments produced by hæmolysis.

Further research by the author shows that sugar and liver extract administered for one day diminish the cholæmia following choloroform anæsthesia to a minimum and cause the complete disappearance of the cholæmia due to the inhalation of ether.

W. A. BRENNAN.



**Beck, E. G.: Bismuth Paste in Surgery.** *Minnesota Med.*, 1919, ii, 157.

The author treats chronic suppurations due to disease and crushing injuries by means of a bismuth paste and finds that this treatment eliminates at least 65 per cent of all such suppurations after they have gone through the usual procedure of surgical treatment.

In order that the reader may fully understand the application of the bismuth paste, the article goes into some detail in describing a sinus or fistula. A sinus or fistula is nothing more than a shriveled abscess or abscesses. It leads from its opening on the skin down to the bone or joint or into the bowel, to the place where the disease originated, and this focus of disease is often at a considerable distance from the opening or openings of the sinus. It is therefore inconsistent to try to eradicate the suppuration by merely dissecting the sinus tracts. The focus must be removed first, the cavity disinfected, and the fistula or sinus injected with bismuth paste. The paste must be injected down to the focus of the disease and must fill up all sinuses or tracts.

The indications are enumerated as follows:

1. All sinuses resulting from chronic suppurating joint affections, tuberculous as well as non-tuberculous. This includes the sinuses following especially spondylitis and hip-joint disease.
2. Sinuses following osteomyelitis of the long bones and flat bones, including the ribs.
3. Sinuses resulting from suppurative diseases of parenchymatous organs, such as the kidney and other glandular structures, including suppurative tuberculous glands.
4. Postoperative sinuses which sometimes remain after the draining of infected wounds.
5. Sinuses following empyema of the pleura or lung abscesses.
6. Cases of abscess and suppuration of the mammary glands.
7. All infected wounds which are due to crushing injuries.
8. Infected and long-suppurating war wounds due to shrapnel or bayonet injury.
9. Rectal fistulae or pararectal abscesses.
10. Suppurative disease of the antrum and accessory sinuses, as well as in postoperative mastoid lesions.
11. Suppurative sinuses about the teeth and jaws in pyorrhoea alveolaris.
12. Chronic endometritis.
13. Cold abscesses. To prevent the formation of a sinus, the abscess should be incised and injected with a 5 per cent bismuth paste.

The author outlines the following errors in technique:

1. The method is often applied indiscriminately and without the control of radiograms.
2. The mixture when injected is not sufficiently liquified to fill all the sinuses and suppurating cavities.

3. The bismuth is applied when the cause of the trouble is either a sequestrum or infected foreign body.

4. The instruments used are often improvised and unsuitable.

5. The bismuth mixture is very often spoiled by the accidental admixture of a few drops of water.

6. The injections are kept up after the wound is sterilized and thus no chance is given for healing.

It is suggested that an examination of the secretions from the sinus be made before the first injection. Then, three days later, more cultures should be made to test the sterilizing effect of the injection. As long as the sinus contains microorganisms, it should be re-injected, but it is advisable to wait at least one week after the first injection before repeating it.

Acute suppurative processes should not be treated with bismuth paste—only chronic suppurations, both tuberculous and non-tuberculous.

Bismuth poisoning may be easily prevented by using smaller quantities. When larger quantities are required they should not be retained longer than ten days.

P. H. KREUSCHER.

**Van Hoesen, B.: Postoperative Analgesia.** *Boston M. & S. J.*, 1919, clxxx, 556.

During the postoperative period the author uses measures similar to those applied in the obstetrical twilight sleep as follows: Morphine  $\frac{1}{32}$  gr. and scopolamine  $\frac{1}{200}$  gr. every four hours by hypodermic injection for twenty-four, thirty-six and, in very painful cases, forty-eight hours after operation.

Four hundred and fifty-two cases so treated in the Cook County and Mary Thompson Hospitals of Chicago are reported. The postoperative analgesia was found to be most beneficial to both the patients and the nurses alike. It greatly decreases complicating stomach symptoms, shortens the convalescence, prevents dread of future operations, and facilitates the work of the nurse. On being questioned as to the details of the first two days following operations, the patients were found to have had not only marked analgesia but also some amnesia.

ARTHUR STEINDLER.

**Regan, J. C.: Some Points Relative to the Technique of Lumbar Puncture in Children.** *Arch. Pediat.*, 1919, xxxvi, 129.

Properly performed, lumbar puncture is such a simple operation on a child that at first thought it would seem unnecessary to deal with it in detail. Many practitioners, however, hesitate to perform rachicentesis, especially when the patient is being treated at home, for fear of an unsuccessful result—the so-called "dry tap." There is no doubt that in many instances this hesitancy prevents a prompt diagnosis and proper treatment. It is therefore extremely important that the technique should be simple and easily followed. Regan has devised a technique which facilitates the performance of this operation in children.



In order to understand the principles upon which the various steps of the procedure are based, it is necessary to know something of the anatomical structure of the vertebræ in the young. At an early age the vertebræ are not distinct and separate bones connected by ligamentous attachments as in later life. The laminae are rather short and wide and the interlamellar spaces are directed obliquely downward. The spinous processes are short, thick, and rather quadrilateral in shape, while the interspinous spaces are quite wide, especially when the body is well-flexed. The supraspinous ligaments are relatively strong and intimately blended with the cartilaginous tip of each spinous process. The termination of the spinal cord is lower in children than in adults.

In rachicentesis two routes of puncture are employed, the median and the lateral, depending on whether the needle is introduced directly between the adjacent spinous processes or laterally at a variable distance from them. With few exceptions, the median route is the most advantageous in children.

Clinically the operation is very easy in all young patients when the needle is inserted in a direction absolutely perpendicular to the spine, the back being well arched so as to increase the width of the interspinous spaces. Occasionally in children over 7 years of age, however, or when, owing to rigidity, the back cannot be well flexed, it is necessary to incline the needle very slightly at an angle of about 70 to 80 degrees with the spine.

The proper site for puncture is the fourth lumbar interspinous space, but in some cases it is necessary to insert the needle at a higher level.

In regard to previous preparation, a few writers believe that a cathartic should be given before the operation. Though rarely essential, this is useful and may well be done if the resulting delay is not a drawback.

If the patient is a small child and can be moved without pain, the best place to perform the operation is upon a table which is long and wide enough to accommodate the patient and high enough to allow for the comfort of the operator. The prone position is the most desirable. The child should lie on the left side with the legs well drawn up and the neck and shoulders well forward to cause as marked an extension of the back as possible.

Some authorities advocate the use of a general anæsthetic. If someone is at hand who can properly hold the patient, it can almost always be dispensed with. Various local anæsthetics have also been advised. As a rule, however, anæsthesia is not only unnecessary, but undesirable.

Asepsis is important. The instruments should be boiled for at least fifteen minutes. The operator should thoroughly scrub his hands with soap and water and rinse them in a solution of 5 per cent carbolic acid, a 1:1000 bichloride solution, or alcohol.

The site of puncture should first be thoroughly cleansed with green soap followed by alcohol, and

after this has dried, the surface should be painted with iodine.

**Technique:** With the needle properly held in the right hand, the first point is its proper introduction. The desired interspinous space should be located and the thumb of the left hand placed deeply into the interspinous space below the spine of the fourth lumbar vertebra so that the finger nail makes a deep indenture just beneath the spine. The needle should then be introduced by the side of, and just below, the thumb.

Three things may occur as a result of the introduction of the needle: (1) the tap may be so-called "dry," (2) pure blood may flow from the needle, (3) cerebrospinal fluid, either clear or mixed with blood or pus, may be withdrawn. When spinal fluid is obtained, the amount to be removed depends upon the purpose for which the operation is being done. If the fluid is to be used for diagnostic purposes, 8 to 10 cubic centimeters is almost always sufficient. In cases of brain tumor, not more than 3 to 5 cubic centimeters should be removed.

For therapeutic purposes the quantity of spinal fluid removed is greater than for diagnosis and hence there is a greater element of danger, especially if the operation is not carried out with the patient in the recumbent position.

When sufficient fluid has been removed, the needle should be withdrawn in such a manner as to prevent oozing of cerebrospinal fluid along the tract of puncture. This is best attained by pressing the thumb deeply into the inner space as was done when the needle was inserted.

After removal of the needle, tincture of iodine should be applied to the site of puncture, and a sterile gauze or cotton pad held in place with adhesive strapping.

The instruments required for operation are a lumbar puncture needle, two or three glass test tubes, a measuring glass, and if serum is to be removed, a receptacle.

If the needle should break during its insertion a small incision may be made and the fragment grasped and withdrawn with a hæmostat. If the fragment cannot be located, an X-ray should be taken and operative procedures resorted to.

In cases of collapse during operation, Jelliffe and White advise the use of ether hypodermically, and after response, the administration of strychnine, adrenalin, and pituitary extract to prolong the stimulation. If this is not effective, the operation should be terminated and the patient given artificial respiration.

The child should remain in bed for at least twenty-four hours after the puncture. If the operation was performed for treatment, he should be kept in bed for forty-eight hours.

G. W. HOCHREIN.

**Foulkes, T. H.: A Simple Operation for Piles.**

*Indian M. Gaz.*, 1919, liv, 137.

The patient is prepared in the usual way and after being anesthetized the sphincter is dilated and a



plug inserted in the rectum to prevent contamination during the operation. Each pile is seized with a Spencer-Wells forceps and pulled down. The forceps on one pile is then held up and a Kocher forceps applied in such a manner that the whole length of the pile is included between the blades of the clamp. By depressing the handle of the Kocher forceps against the buttocks, a ridge of mucous membrane is raised above the point of the forceps. A suture is passed through this fold and tied. A forceps is then snapped to each end of the suture, and from either side of the pile just below the Kocher forceps the sutures are pushed through at about the center of the latter and tied around the lower end of the forceps as the Kocher is removed. The pile may now be cut away or left.

In this operation there is little or no bleeding, the pain is slight, and the patient is up and around in a short time.

I. E. BISHKOW.

**Ferrán, J. E.: Local Anæsthesia in Urgent Interventions and a New Operative Technique for Elephantiasis of the Legs** (*La anesthésia local en las operaciones de urgencia y una nueva técnica operatoria para la elephantiasis de las piernas*). *Rev. de med. y cirug.*, 1919, xxiv, 129.

Ferrán has performed pleurotomies, costal resections, and operations for inguinal and abdominal herniæ under local anæsthesia with very satisfactory results. Having been struck with the efficacy of local anæsthesia in dealing with the skin and cellular tissues, he decided to operate in cases of elephantiasis by this method.

According to the technique described, elliptical non-corresponding incisions several inches long are made longitudinally down the leg. The edges of the ellipse are then sutured together, the catgut passing through the skin and then through the edges of the underlying tissues without traversing them down to the muscle. In the depths of the muscle the needle is passed horizontally and out on the other side. Four or five catgut threads are used. This closure the author calls an "anastomotic inclusion." He does not insist on extirpation of the elephantiasic tissue as he has observed that it is very rapidly resorbed.

By the method of suturing described there is a veritable anastomosis of the lymphatics, arteries, and veins which act as true syphons, absorbing the lymph by the intimate relation effected between the dermis and the muscles. A small wick drain is inserted at the lowest part of the incision. The rapid absorption of the elephantiasic tissue is aided by the application of a strongly compressive elastic bandage.

W. A. BRENNAN.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Skillern, P. G. Jr.: A Series of War Wounds Treated with Dichloramine-T.** *Ann. Surg.*, 1919, lxix, 498.

In August, 1918, a depth bomb exploded prematurely on a United States ship at sea, killing

four men and injuring twenty-three others. The more important injuries included perforation of bowel, 4; penetration of the lung, 7; laceration of femoral vessels, 2; laceration of the penis and scrotum, 2; laceration of the eyeball (extensive), 1; rupture of the eardrum, 8; fracture of the skull (occipital), 2; fracture of the mandible, 1; fracture of the humerus, 2; fracture of the radius and ulna, 1; fracture of the femur (incomplete), 1; fracture of the patella, 1; fracture of the tibia and fibula, 2; fracture of the tibia, 1; and fracture of the tibia (incomplete), 2.

This list by no means represents all the injuries, for there were numerous punctures and lacerating wounds of various soft parts. The fractures were for the most part compound and many were comminuted. In the entire group of patients, several hundred injuries had to be discovered and dealt with. The only deaths occurred practically immediately after the accident from the overwhelming shock of multiple extreme injuries. There was no operative mortality. The twenty-three survivors ultimately were either sent back to duty or honorably discharged from the service.

The chief purpose in reporting this series is to attest the value of dichloramine-T. The primary dressing in each case after the accident consisted solely in filling the wound with dichloramine-T and inserting a short length of rubber dam to maintain the patency of the drainage orifice. Over all there was then applied and secured a dry, sterile gauze pad.

The ship reached port five days after the explosion and on arrival the patients were transferred to a hospital. Several months after the accident the author was informed by the surgeons who attended these patients at the hospital that not a single wound had developed the slightest evidence of infection; cultures which were made from wound discharge invariably proved sterile.

**Tubby, A. H., Ferguson, A. R., Mackie, T. J., and Hirst, L. F.: A Report on the Action of Flavine and Its Derivatives.** *Lancet*, 1919, cxcvi, 838.

The writers conducted experiments to determine the action of flavine and its derivatives upon organisms in the blood-stream when administered intravenously. No definite curative influence could be demonstrated either with proflavine or acriflavine in bacillæmia, a result which is only what might be expected in view of the rapidity with which the flavine compounds are eliminated from the circulation.

By the use of a method which insures the gradual dilution of the flavine solution by the blood, the immediate effect of its agglutinating action on the red blood corpuscles can be prevented.

In vitro, flavine proved highly efficient as a disinfectant for blood if allowed time to exert its full action.

E. B. FREILICH.



**Lusk, W. C.: The Disinfection of Vitalized Tissues and the Healing of Wounds with Chinolol and Salt.** *Ann. Surg.*, 1919, lxi, 493.

Chinolol is pure normal oxyquinoline sulphate. In vitro, though a powerful antiseptic, it is only slightly germicidal. A 2 per cent solution did not kill *staphylococcus aureus* in twenty-four hours. Its disinfecting action on vitalized tissues is probably due, therefore, to the excitement of physiological stimuli which increase the natural forces of resistance.

The author gives examples of cases treated with chinolol and salt. The tincture (2 per cent chinolol and  $1\frac{1}{2}$  grains of sodium chloride to the ounce in 80 per cent alcohol) applied once a day to the skin around a furuncle after the removal of all grease with a fat-solvent will prevent infection of neighboring hair follicles.

In suppurating and granulating wounds the solutions used contain 2 per cent of chinolol with either 0.85 per cent or 5 per cent of sodium chloride. The healing of blind tracts of soft parts may be facilitated by injecting the tracts once in six or eight hours through tubes having no punctures. For this purpose the 2 per cent chinolol solution with the 5 per cent salt content is probably the better solution of the two. For the control of sepsis in draining empyema, the solution of 2 per cent chinolol with the 5 per cent sodium chloride content is recommended. Following preliminary washing with salt solution, 1 ounce may be injected into the cavity daily and should be retained by posture.

First-aid treatment is effected either by packing the wound with gauze saturated with a solution of chinolol, 4 grains to the ounce and 0.85 per cent sodium chloride, renewed in twenty-four hours, or by simply sponging the wound freely with the solution during the operation for its immediate repair. The value of chinolol as a first-aid disinfectant was determined by animal experimentation.

The merits of chinolol in combination with salt as a tissue disinfectant may be summarized as follows: Stability; ease of application; applicability to first-aid treatment of wounds; a tendency to dry up pus; non-irritability when applied in accordance with the technique here advocated, unless possibly after prolonged use; and the facts that it appears not to attack tendons and facilitates the separation of sloughs. P. G. SKILLERN, JR.

## ANÆSTHETICS

**Silk, J. F. W.: Anæsthesia; A Modification of the Open Ether Method.** *Brit. M. J.*, 1919, i, 635.

Silk is of the opinion that the particular requirements of war surgery have given a great impetus to the use of ether as a general anæsthetic for routine work, and especially to its administration by the open method. Because of certain difficulties which

inexperienced anæsthetists have encountered in the way of long induction, excessive amount of ether employed, and the objection of the patient to the taste and smell of "straight" ether, the author proposes a mixture of 1 dram of chloroform and 32 drams (4 ounces) of ether which is approximately 3 per cent of chloroform in ether or a very little stronger (3 in 99). The face pad and mask are the same as for open ether and the mask is closely applied to the patient's face from the beginning. The liquid is used exactly as if it consisted of ether alone, the presence of the chloroform being ignored.

The same care in watching and maintaining the breathing are required in this as in any other method of anæsthetization; it is not assumed that the plan is absolutely fool-proof.

The advantages claimed are: simplicity, rapidity of induction (five to ten minutes), lack of irritation, efficiency, economy, and safety.

The greatest expenditure of the liquid occurs during the induction stage and seldom exceeds a couple of ounces. For the maintenance of anæsthesia after the induction stage, it is estimated that from 4 to 6 ounces are ample.

While it cannot be claimed that this or any other anæsthetic is absolutely safe, the possibilities of over-dosage with chloroform are much diminished when the  $\frac{1}{2}$  dram required for induction is diluted in 2 ounces of ether and given in ten rather than in two minutes. Moreover the dram to a dram and one-half used in the course of an hour is not apt to do much harm.

I. C. HERB.

**Davis, N. C.: The Influence of Fasting and Various Diets on the Liver Injury Effected by Chloroform Anæsthesia.** *Arch. Int. Med.*, 1919, xxiii, 612.

The author points out that as an introduction to a study of liver injury due to chloroform anæsthesia it is necessary to understand clearly how uniform the individual reaction to this drug is under uniform conditions. Data are submitted sufficient to convince a sceptic that the liver injury in a given dog will be uniform in extent provided the intake of blood is accurately controlled and the dog is in good clinical condition.

The evidence shows that a unit injury due to a unit of chloroform anæsthesia under fasting conditions will be repeated accurately again and again provided the dog is given sufficient time to repair each injury to normal. This gives much confidence in the interpretation of results and enables the author to draw finer distinctions as to the type and extent of the injury. In a review of the literature it will be noted that there is the greatest amount of variation in the recorded susceptibility of dogs to chloroform, but few if any figures are given to show the diet conditions which the author feels sure would explain the remarkable discrepancies.

In some instances unusual individual resistance or hypersusceptibility to chloroform poisoning was



recorded in the investigations reported, but such exceptions were rare and obtain in all physiologic or pharmacologic experiments. When a sufficient number of experiments are submitted, the law of reaction may be established and the few individual exceptions put aside for later consideration. It is truly astonishing to note the uniformity of the liver injury which follows a suitable unit period of chloroform injury to a dog after three or four days of fasting. Under such conditions the dog is the ideal subject for a study of chloroform injury and repair.

In this communication are given the results of feeding experiments which are corroboratory of Opie's work on rats and bring out a few new and interesting points.

Most of the experimental animals were young dogs and pups but a few older, adult dogs and rats were also utilized. As a rule the feeding of special diets was continued from three to six days and the exact time was indicated in the individual protocols.

Data have accumulated in regard to numerous starvation controls, but to avoid repetition only a limited number of these records have been included in the tables. In most cases the food for the dogs was left in the cages. Pups ate special or limited diets more readily than older dogs. Fluids, such as cottonseed oil, sugar solution, beef-extract solution, etc., were given by stomach tube.

The author offers no adequate explanation of the protective or injurious effect of any diet in modifying the action of chloroform, but recalls that Graham correlated resistance with the glycogen content of the liver. This is an attractive theory and in some cases seems to hold true. Carbohydrate diets certainly build up liver glycogen; the storage can be readily seen in ordinary sections stained with hæmatoxylin and eosin. However, if Kuriyama's work is reliable, glycogen storage is very difficult and glycogen elimination very prompt when thyroid is given. On the other hand, the protective action of sugar or kidney is not changed by the addition of thyroid, and thyroid given alone previous to chloroform does not modify the picture of ordinary starvation plus the effect of chloroform.

The facts brought out by the experiments reported are summarized as follows:

Starved animals are very susceptible to liver injury from chloroform. A maximal injury is to be expected.

When sugar and diets rich in carbohydrates are fed in the days preceding chloroform anæsthesia, they have a marked protective action against liver injury.

Fat alone, or combinations of food containing fat in large proportion, induce a maximal susceptibility to liver injury comparable to that induced by starvation.

Skeletal muscle and heart muscle seem to have a slight protective action.

Beef extract is highly protective in proportion to its actual food value.

The parenchymatous organs, liver and kidney, exert a considerable amount of protection.

Brain, although rich in lipoid substances, is a protective food against chloroform injury, thus being very unlike fat mixtures.

Skim milk alone and commercial casein alone or in combination with cracker meal are highly protective diets.

Gelatin has but slight protective action itself, and when given in mixtures with sugar does not lessen the protective value of the latter.

Thyroid powder given alone or in combination with foods (sugar, fat, etc.) apparently does not modify the chloroform injury which is to be expected without such addition.

Glucose or cream given intravenously during chloroform anæsthesia does not modify the effect of the drug on a starved animal. In one instance in which casein digest (high in amino-acid content) was given by stomach tube a few minutes before chloroform anæsthesia, a slight protective action was noted.

No single theory so far advanced will explain this peculiar protective action of certain food substances against the liver injury of chloroform anæsthesia. It certainly is a reaction of the liver-cells, not of substances circulating in the blood.

These facts should not be lost sight of in the management of cases in which the use of chloroform is indicated. The patient should be given liberal amounts of carbohydrates and milk for at least two days preceding the anæsthesia. It cannot be too often emphasized that it is dangerous to give chloroform to man or animals whenever a fasting period has preceded the administration of the anæsthetic.

G. E. BEILBY.

**Davis, N. C., and Whipple, G. H.: The Influence of Drugs and Chemical Agents on the Liver Necrosis of Chloroform Anæsthesia.** *Arch. Int. Med.*, 1919, xxiii, 636.

Among the various explanations offered for the well-known liver injury from chloroform, Graham's theory is perhaps the most attractive. Graham believes that in the presence of water and oxygen in the body, chloroform is split and hydrochloric acid and carbon dioxide are formed. The hydrochloric acid then kills a certain amount of liver parenchyma, either by direct action or secondary asphyxia.

The authors admit that they are unable to follow the chemical reactions as outlined by Graham. They state, furthermore, that it is just as difficult to explain chloroform necrosis as to explain why chloroform passes by all of the body tissues until it reaches the liver, where the hypothetical chemical reaction takes place with the release of hydrochloric acid. The specific susceptibility of the liver-cell to chloroform is the riddle which has so far defied solution.



Graham produced liver necrosis in dogs by injecting hydrochloric acid into the portal vein, but the necrosis differed from typical chloroform injury in being portal (peripheral) rather than central. Hydrochloric acid given by the stomach tube to rabbits generally proved fatal. At necropsy the animals were found to have fatty livers and hæmorrhages in the stomach and duodenum. The areas of central necrosis in chloroform poisoning gave an acid test with the neutral red and a chlorine test with silver nitrate and sunlight.

The authors have attempted to repeat Graham's observations on the protective action of sodium carbonate given intravenously during chloroform anæsthesia. The anæsthetic was administered at first over a period of four and one-half hours. They have found, however, that the liver injury was much more uniform after preliminary starvation which renders the animals more susceptible to injury and that therefore a shorter period of anæsthesia is sufficient to cause it. Their usual procedure then was to give one and one-half hours of chloroform anæsthesia (by the drop method with personal attention) to dogs which had fasted three days, and one and one-quarter hours of anæsthesia to those which had been fasting four days.

The experiments reported in this paper naturally fall into three groups. The first group contains those designed to repeat Graham's work on the protective action of carbonate solution against chloroform injury. Under carefully controlled conditions, the authors were not able to corroborate Graham's findings.

The second set of experiments was undertaken with the hope of sparing or diminishing the liver glycogen by means of drugs, and to see whether such reactions affected the subsequent injury of the liver by the chloroform. In these the evidence was more or less contradictory. The epinephrin and quinine treatments fulfilled the requirements for which they were chosen in that the injury was lessened, but whether or not this effect was the result of increased liver glycogen was not determined. Strychnine, supposed to decrease the glycogen content, did not cause any marked increase in the chloroform injury. Hydrazine sulphate, also known to lessen the glycogen content of the liver, caused an increase in fatty degeneration, but appeared to lessen the necrosis. The status of liver glycogen in relation to injury of the liver by chloroform is therefore not settled by the results of these investigations.

The third group of experiments was designed to obtain evidence concerning the relation of bodily oxidations to the necrosis of the liver due to chloroform. It would appear that large doses of "toxic proteose" intensify the injury while small doses have no effect. Potassium cyanide has a very prostrating immediate effect, but seems to have very little influence on delayed liver injury and necrosis. The results of these experiments

are hard to reconcile with a theory of chloroform necrosis due to lower oxidation.

Although chloroform is losing favor as an anæsthetic, some physicians still employ it extensively. In view of the frequent therapeutic administration of such drugs as epinephrin and quinine, it may be well to call attention to a possible new use for them. In cases of pernicious vomiting, for example, it would be very dangerous to use chloroform because of the starvation of the tissues, but it might be possible to lessen the probable liver injury by means of these drugs.

The authors summarize their conclusions as follows:

Sodium carbonate in hypertonic salt solution given intravenously during chloroform anæsthesia has no protective action against the liver injury resulting from the chloroform.

Phosphate solutions, high in buffer content, have no protective action against chloroform liver injury.

Epinephrin given subcutaneously or intramuscularly in the days preceding chloroform anæsthesia exerts a distinct protective action against the injury of the liver by the chloroform. Some time is required for the development of the resistance and it is not demonstrable after a single dose of epinephrin given a short time before the administration of the chloroform.

Quinine sulphate given in the days preceding chloroform anæsthesia exerts a marked protective action against liver injury.

Hydrazine sulphate, although itself injurious to the liver, apparently does not intensify, and perhaps lessens, the toxic action of chloroform.

It would appear that strychnine sulphate has very little deleterious action on an ordinary chloroform injury following starvation.

Toxic proteose solutions in large dosage may intensify the chloroform injury, but in small amounts seem to have no effect.

Potassium cyanide given intravenously during chloroform anæsthesia, although very toxic at the time, seems to exert little if any influence on the delayed chloroform poisoning (liver injury.)

The hypothesis that glycogen protects the liver-cells against the injury of chloroform will not explain all the observed facts. Some of the experiments were in harmony with this hypothesis, but others were equally positive against it. This simple explanation of the resistance of liver-cells to chloroform injury does not suffice, and undoubtedly other factors are concerned which must be searched out.

The hypothesis that chloroform injury and liver necrosis are to be explained by a lowering of the level of tissue oxidation (tissue asphyxia) receives no support from our experiments.

The peculiar protective action of epinephrin and quinine sulphate in chloroform poisoning may have some practical clinical application.

G. E. BEILBY.



**Rood, F., Lockhart-Mummery, J. P., Cole, P. P., Shipway, F. E., and Blomfield: Discussion on the Present Position of Spinal Anæsthesia.**  
*Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Anæst., 1.

Rood has always used stovaine except in about 250 cases in which novocaine was employed. After this trial of the latter he concluded that although novocaine produces perfect anæsthesia, it does not cause a muscular relaxation equal to that due to stovaine.

A 5 per cent solution of stovaine the density of which was increased by the addition of 5 per cent of dextrose was used in most cases. As this solution is heavier than the cerebrospinal fluid, the region and extent of the anæsthesia obtained can be regulated by the position of the patient during the injection. Although the stovaine-dextrose solution is diffusible, its movements are controlled by gravity for a few minutes after injection.

In a few hundred cases a solution of stovaine in saline was employed. It was found that, irrespective of the position of the patient, the stovaine diffused about 10 inches upward from the point of the injection and equally on both sides of the body. It was possible to limit its action or to increase it beyond this point only by increasing the dose and this had little effect. The anæsthesia produced by the saline solution was found to be more transient than that due to the denser solution and it was generally necessary to employ almost double the dose of stovaine to produce equally long anæsthesia.

When spinal anæsthesia was first used the great merit claimed for it was that it did away with the necessity for a general anæsthetic. Rood believes, however, that this is its great disadvantage. The fact that the patient is conscious—is present at his own operation—outweighs many of the advantages of spinal anæsthesia, and nowadays it is rarely employed without either some modification of "twilight-sleep" or a little general anæsthesia. In his opinion, also, a long operation in the Trendelenburg position or an operation on the rectum such as a combined abdominal-perineal operation, are ordeals which very few patients could stand while conscious even if it were to their advantage to do so. For severe operations the method he has employed has been to produce anæsthesia with ether, then inject the stovaine, discontinue the ether for a time, and finally give sufficient ether to keep the patient unconscious. For operations of a less severe type, scopolamine and morphine are administered about an hour before.

The safety of spinal anæsthesia as compared with that of other methods of producing anæsthesia is relative rather than absolute. There were 2 deaths in 8,000 cases. The postmortem examination in a case of intestinal obstruction showed the respiratory passages filled with vomited matter. The second death was that of a child 4 years of age who was suffering from gangrenous intussusception which

Rood believed was due to a fall in blood-pressure caused by the stovaine added to the shock already present. Other complications during the course of the anæsthesia have resulted from: (1) interference with the respiration due to the fact that the stovaine reached too high a level; (2) complications arising from a fall in the general blood-pressure, syncope, etc.; and (3) vomiting.

Headache, vomiting, and pulmonary complications occasionally follow the administration of stovaine. Headache, which was sometimes severe, was more common when the patients were conscious during the operation. Acute septic conditions, such as appendicitis and osteomyelitis, were generally present in cases in which pneumonia developed. Occasionally pulmonary complications followed operations upon the upper abdomen.

The after-effects which have been reported may be due to some error of technique. Permanent palsies were more frequent when the puncture was made very low down, i. e., between the third and fourth lumbar vertebræ. Rood generally makes the injection between the eleventh and twelfth dorsal vertebræ.

The impression that spinal anæsthesia is a substitute when the patient is too ill to stand a general anæsthetic has been responsible for many of the reported failures. It is difficult to generalize as to the value of spinal anæsthesia in heart disease. In mitral disease with pulmonary congestion it is sometimes very useful, but certainly never in aortic disease nor in any other cardiac or vascular condition in which the patient is prone to attacks of syncope.

In the discussion following the reading of the article Cole stated that he first employed the glucose solution but discarded it in favor of a solution of sodium chloride the use of which allows the patient to be placed in the Trendelenburg position at once. When this is not necessary the feet should always be kept higher than the head both during and after the operation. The posture recommended does much to abolish the effects of diminished blood-pressure. In Cole's experience sodium chloride solution guarantees as lasting an anæsthesia as glucose solution.

Shipway was of the opinion that diffusion plays a very small part in producing serious symptoms. Faintness, pallor, vomiting, and collapse are all due to the decided fall of blood-pressure which results from the impairment of thoracic breathing and the paralysis of abdominal and skeletal muscles. The tone of the abdominal muscles of the trunk below the diaphragm and of the muscles of the lower limbs plays a very large part in maintaining blood-pressure. It is known that blood-pressure may fall as much as 50 millimeters in about ten minutes after injection. Such a marked fall is often dangerous.

The two important features brought out by Rood are, first, the possibility of using spinal anæsthesia with patients in the Trendelenburg position, and



second, the advantage of combining spinal with general anaesthesia. Concerning the latter he thinks that both Crile and Mummery underrate the power of inhalation anaesthesia to prevent shock. Everyday experience shows us that shock from operative procedures is effectively prevented by proper inhalation anaesthesia and the physiologists themselves have shown how difficult it is to produce shock in an etherized animal unless the abdomen is open and the viscera forcibly manipulated.

I. C. HERB.

## SURGICAL INSTRUMENTS AND APPARATUS

**Churchman, J. W.:** Use of Continued Extension by Means of a New Extension Frame in the Bloodless Reduction of Congenital Dislocation of the Hip. *Surg., Gynec. & Obst.*, 1919, xxviii, 518.

The object of the modification of the Lorenz technique suggested by the author is to eliminate the risk of the latter while adhering to its principles by substituting for the violent manipulations under anaesthesia a rather gradual extension.

To this end, a new extension frame has been devised to put extension on the leg in any desired position of abduction and at the same time keep up any desired type of rotation.

With the frame described the muscles may be stretched gradually to any desired degree absolutely without pain, and the head of the femur gradually laid into position entirely by extension and rotation or by these methods supplemented by the slightest possible manipulation.

After the reduction of the dislocation, the case is treated exactly as advocated by Lorenz.

The extension frame consists of a  $1\frac{1}{4}$  inch gas pipe bent into a circle. If abduction beyond a right angle is desired, or it is found that with abduction at nearly a right angle the child overcomes the abduction by rising in bed, the extension frame is shifted to the head of the bed in which position it is possible to obtain any desired degree of abduction. For rotation, straps are attached in the usual fashion and led to pulleys which can be fastened at any point of the frame.

The method described briefly is as follows:

1. Application of extension in the lines of the legs as they rest in their deformed position.
2. Gradual abduction until the legs form with each other an angle of 180 degrees.
3. When the maximum abduction has been produced, digital manipulation of the heads of the femurs to drop them into place.
4. Maintenance throughout of the degree of rotation necessary to keep the toes pointing directly upward.
5. Gradual reduction of the maximum abduction produced until the legs form with each other an angle of about 35 degrees.
6. Application of a plaster cast from the waist to the knees.

7. Transmission of the body weight to the acetabula through the heads of the femurs by allowing the child to walk.

If a favorable case in a young infant with well-developed acetabula is treated in this way, it will be found, not only that the treatment will be simplified by the elimination of the violent manipulations used heretofore, but also that more accurate results will be obtained. The head of the femur can be placed at will exactly where desired, and if roentgenographs show that the position is not entirely satisfactory, the necessary correction can be made by changing the direction of the extension or rotation straps.

L. C. DONNELLY.

**Lee, J. R.:** Compound Fracture of the Femur in its Upper Third, with Demonstration of a New Pelvic-Femur Splint; Also a Splint for Fractures of the Upper Extremity. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 6.

The method of fixation of the fractured femur here described is based upon an appliance for the control of the smaller upper fragment which is flexed and abducted by the iliopsoas and gluteal muscles. It has always been taught that in fractures of the upper third of the femur the upper fragment, which is short, cannot be controlled and therefore attempts have been made to procure alignment by abducting the lower fragment. This method is wrong in principle for the strong adductor magnus strongly adducts the lower fragment, and the distance from the symphysis to the adductor tubercle is 2 inches or more greater in the abducted position of the thigh.

The new pelvic-femur splint consists of a grip with two pads which fit any pelvis comfortably and securely, and grasp the pelvis and upper part of the femur firmly on both sides. By means of a fly nut on a screw the required amount of pressure is regulated to bring the small abducted upper fragment down and hold it in place. Both limbs are put up in modified Thomas frames which are hinged onto the pelvic grip. If much extension is found necessary, an adjustable piece can be fitted from the pelvic pad to the axilla on each side; in this way the upward thrust of the extending force will be partly taken by the axillæ and trunk and the pelvic caliper grip will not be displaced. A wooden splint to the back of the lower fragment may be needed also to correct backward displacement. All manipulations should be done on an X-ray couch and if necessary under an anaesthetic, so as to see that the two ends are approximated and in actual alignment. With this appliance the patient can be readily moved and nursing is facilitated. The appliance is of value also in treating a fractured pelvis.

The arm splint described consists of two parts, one fitted to the trunk and the other to the fractured arm. The upright trunk part is fitted to the hip with an adjustable piece which allows its upper forked end to be securely fitted into the axilla and



is fastened around the body by two straps. The part of the splint which carries the limb is attached to the upper forked end of the trunk portion by joints so that the arm can be supported at any desired angle. The splint can be used for either the

right or left side by reversing the hip portion which is attached by an adjustable screw. With this appliance the splint carries the arm rather than the reverse and the fracture can be kept at rest and in comfort.

P. W. SWEET.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Carter, W. W.: Bone Transplantation, the Ideal Method for the Correction of Saddle-Back Nose.** *N. York M. J.*, 1919, cix, 899.

Carter believes that in the light of our present knowledge, the use of foreign material of any kind introduced into the tissues for the purpose of correcting nasal deformities is unwarranted, and so far as he knows, there is no material suited for this purpose except the autogenous bone transplant. He prefers the rib for transplantation purposes for the following reasons: it is quickly, easily, and safely removed, recovery is prompt, there is no loss of function resulting from its removal, and the small gap between the ends of the rib is quickly filled in with bone, ossification proceeding from the cut ends of the rib along the periosteum the inner layer of which is left when the rib is shelled out.

Usually he takes a section from the ninth rib. If it is necessary for the transplant to reach nearly to the tip, he takes the section at the juncture of the rib and the costal cartilage. The transplant is introduced from within the nose after a proper elevation of the tissues has been effected by the use of instruments especially designed for this purpose, its upper end being placed in close contact with the frontal bone. To prevent the slight depression which sometimes occurs on either side of the strip of bone, Carter has recently used the cancellous tissue and bone shavings to fill in the irregularities and round off the dorsum of the nose.

The success of the operation depends chiefly upon three factors: strict asepsis, an abundant supply of nourishment to the implanted bone, and immobilization of the part.

E. C. ROBITSHEK.

**Waldron, C. W., and Risdon, E. F.: Mandibular Bone-Grafts.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 11.

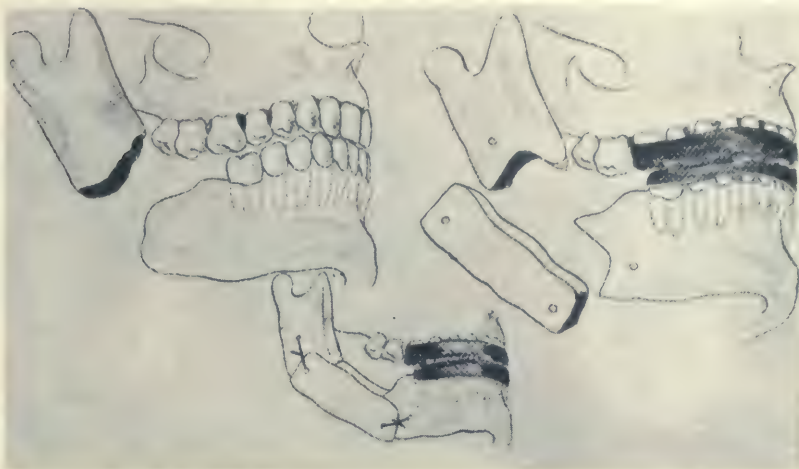
In the early treatment of mandibular compound fractures with loss of bone substance, persistent efforts should be made to keep the mouth as clean as possible by frequent mouth washings and irrigation of pockets and sinuses. All sinuses should be freely drained and any attached comminuted fragments should not be disturbed until they become separated and remain as sequestra. Displaced fragments should be corrected and held by dental splints for two months or more. Teeth too near the line of fracture or those predisposing to infection of the wound should be extracted, but those which

will be of service in immobilization of the parts when the graft is placed should be preserved. The date when all external and alveolar sinuses have definitely healed should be noted as no operative procedure should be undertaken until at least six months have elapsed after the complete disappearance of all inflammatory processes.

At least a week before the operation the dental splints should be cemented to the teeth in order that the mucous membrane of the mouth may become accustomed to them. The anæsthetic used is ether oil administered by rectum and ether administered intrapharyngeally through a nasal tube. After the field has been prepared with ether and iodine, a sterile dental rubber dam is fixed to the cheek and lower lip with adhesive. By turning this upward, the mouth is walled off and soiling by saliva is prevented. At the conclusion of the operation the rubber dam is turned down over the wound as a part of the dressing.

One type of graft is illustrated by the accompanying drawing. The incision is made so that it will be below, rather than over, the graft. The non-touch method is used. The ends of the fragments are exposed  $1\frac{1}{2}$  to 2 centimeters back and great care is taken not to perforate into the mouth cavity. The ends of the fragments are trimmed back until good, healthy, bleeding bone is reached. All cicatricial tissue should be excised. The rongeur forceps are used in preparing the graft and fragments. The ends of the fragments are squared off as well as possible, leaving a ledge above the graft which affords additional surface contact between the fragments and graft. When one end is well forward, an overlapping joint or a notching of the posterior fragment may be advantageous. The iliac crest is exposed and a piece of the proper size removed with small chisels and thin saws. Usually there is considerable free hæmorrhage which will require drainage of, and firm pressure to, the wound to control it. From this site, a shape suitable to the requirements of the case may be had with the minimum amount of modeling. Holes are drilled into the ends of the transplant and ends of the fragments, and short pieces of Belgian wire are threaded through and tightened. The subcutaneous tissues are closed with interrupted catgut and the skin closed with horsehair after all hæmorrhage is controlled.

On account of the wound of the iliac crest the patients are kept in bed for ten days. The diet is at first liquid, then semisolid. Splints are left on for



Left above: Non-union in region of angle. Control of posterior fragment most difficult.

Right above: Splint fixation of anterior fragment. Preparation of fragments for graft.

Below: Posterior fragment wedged backward by graft. (Waldon and Risdon: Mandibular Bone-Grafts)

from three to four months, and removed only when the progress, as shown by the X-ray, is satisfactory.

In reviewing the cases the author concludes: (1) that restoration of function may be expected in a large percentage of cases; (2) that both surgeon and dental surgeon must give careful attention to the case to the final stage; (3) that the iliac crest is best suited for grafts of mandibular fractures; and (4) that good contact of grafts to fresh healthy bone and the maintenance of the graft in position by wiring is essential.

P. W. SWEET.

**McCauley, D. H., and Worthley, D. L.: The Treatment of Ununited Fractures of the Jaws. Résumé of Work Done by the Dental Department, U. S. A. General Hospital No. 11, Cape May, N. J. *Dental Cosmos*, 1919, lxi, 391.**

War surgery has presented problems and difficulties quite different from those met with in civil practice and of these the dental surgeon has had his full share, particularly in the treatment of fractures of the jaws due to gunshot wounds.

In civil life, fractures of the maxilla and mandible are seldom complicated by a loss of substance. In war injuries, however, such a loss is the rule rather than the exception.

In the cases reported the patients had received their wounds from six weeks to four months previous to the time treatment was begun. Only a few were not in good condition, in spite of the fact that there was a lack of proper materials for treatment. Splints had to be devised from 2-franc pieces, chicken wire, telephone wire, and any other malleable metal which could be obtained.

Immobilization for from three to four months was always necessary to secure union when there was a loss of substance. Such immobilization should be instituted with the muscles relaxed and the jaws in the position of rest. The danger of trismus following immobilization is very slight.

To force the jaws apart gradually the authors suggest the use of a simple tapered screw which can be adjusted by the patient himself. As the muscles seem to contract more at night during normal sleeping hours than at any other time, the patients were given a cork with a wire attached to place between the teeth before going to bed. Larger corks were substituted at regular intervals.

Food and fresh air are important factors in the successful treatment of any fracture. When the jaws have been immobilized, the food must, of course, be liquid or semi-liquid.

The authors report many interesting cases of fracture of the jaws which were treated successfully.

M. N. FEDERSPIEL.

**Ochsner, A. J.: Double Harelip and Cleft Palate. *Surg. Clin. Chicago*, 1919, iii, 257.**

The first and probably the most important step in the operation for the repair of double harelip and cleft palate must consist in the adjustment of the intermandibular portion of the upper jaw to secure proper support for the lip which is to be constructed. To replace this portion of the jaw a triangular segment of the vomer which has pushed this portion forward should be cut away. The lateral edges should then be freshened as well as the ends of the alveolar processes on each side.



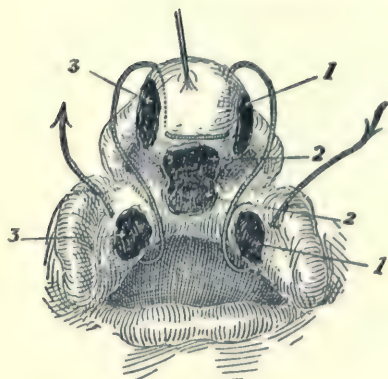


Fig. 1.

Fig. 1. Double congenital harelip and cleft palate. Appearance after intermandibular portion has been freed at 2-2 and elevated; the areas 1-1 and 3-3 are freshened and a silkworm-gut suture applied as shown.



Fig. 2.

Fig. 2. Second stage of operation. The dotted lines are lines of incision; a suture has been passed through the mucocutaneous line of each side of the lip as a guide.



Fig. 3.

Fig. 3. Result at conclusion of operation.

After this, the intervening portion should be carefully sutured to make a continuous alveolar process. In doing this care must be taken not to interfere with the new teeth which are being formed.

Ochsner has found that fine silk, silkworm gut, or silver wire is best adapted as suture material for this purpose.

In the majority of these cases it is necessary to limit the amount of operating done at a single sitting. The child's strength is not always sufficient to warrant a continuation when the next procedure may involve a considerable loss of blood. Hence the second step may be postponed safely for one or two weeks.

In the closure of the harelip the central portion is utilized to secure a sufficient amount of tissue without undue tension. The mucous membrane is trimmed from it to form a rectangular flap and the edges of the lateral portions are trimmed so that the surfaces to be united are left entirely over the mucous membrane. To elevate the septum of the nose and at the same time increase the depth of the upper lip, a small lateral incision is made in the lateral flaps. The corners of the central flap can then be adjusted so that they fit into the angle formed after the lower portions of the lateral flaps have been drawn downward. A suture is next applied to the lateral projecting portion of the lip on each side, and by means of this portion the lip is lengthened and the lateral flaps are applied to the central part. All the surfaces are then sutured in place. The first silkworm-gut suture is passed through the lip and left untied. Then the mucous membrane is sutured posteriorly throughout with chronic catgut sutures, and finally the skin surfaces are closed with horsehair. The silkworm gut is tied loosely enough to prevent pressure necrosis and tightly enough to serve as a stay suture. The lateral flaps are supported by means of rubber adhesive strips 3 centimeters wide.

## NECK

**Sybenga, J. J.: Anterior Dislocation of the Atlas with a Break in the Continuity of the Anterior Arch. *J. Am. M. Ass.*, 1919, lxxii, 1450.**

A soldier 24 years old was injured while making his escape from a German air raid and found unconscious by the roadside. When he revived he complained of severe headache and pain in the neck. On admission to the hospital the neck was found to be stiff and rotation was limited.

Except for a slightly more active right knee-jerk and slightly increased tone of the muscles of the right side, there were no changes. The stereoscopic X-ray examination seemed to reveal an anterior dislocation of the atlas and a break in the continuity of its anterior arch. The author points out, however, that the anterior arch sometimes develops two bone centers and the break in continuity seen in the X-ray might be due to lack of fusion of the centers instead of a pathologic condition.

A. STEINDLER.

**Gault: The Treatment of Hæmorrhages from the Large Vessels of the Neck by the Endopharyngeal and External Routes Combined (Du traitement des hémorrhagies des gros vaisseaux du cou par voie endo-pharyngée et voie externe combinée). *Presse méd.*, Par., 1919, xxvii, 301.**

Wounds of the large vessels of the neck are generally susceptible to pressure exerted on the carotid tubercle followed by the classical ligatures. When such wounds are very high, especially endopharyngeal, the usual ligatures are extremely difficult to apply or impracticable.

From several cases the author concludes:

1. In endopharyngeal wounds of the large vessels of the neck, immediate endopharyngeal pressure under endoscopic control if possible is efficacious. This pressure is made with the three middle fingers



of one hand; a compressive tampon closing the vessels on the transverse apophyses and controlling the hæmorrhage which if not checked would be rapidly fatal.

2. The tamponade described affords the time to make the necessary cervical ligatures and, if necessary, compression of the lateral sinus by the mastoid route.

3. A venous hæmorrhage can be thus overcome in almost all cases and an arterial hæmorrhage in many. In cases of wounds of the internal carotid

which are situated very high, it has been shown by research on the cadaver that high endopharyngeal ligature of the vessel does not present very great difficulties from the operative point of view. On the living subject it is quite possible for a surgeon accustomed to endoscopic manœuvres to slip the compressing fingers along the vessel until the bleeding point is reached and clamp the vessel there with a forceps. A loop of thread is then slipped over the forceps and tied with the aid of two dissection forceps.

W. A. BRENNAN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Davis, B. F.: Winged Scapula—Serratus Magnus Palsy.** *Surg. Clin. Chicago*, 1919, iii, 391.

The author reports two cases of winged scapula, the first in a girl of 19, who gave the history of having fallen down a flight of stairs, striking on her right shoulder. The soreness disappeared after a couple of weeks but she was unable to raise the arm from the side beyond an angle of about 45 degrees. There was no restriction to passive motion.

On examination, the scapula was found to flare out from the plane of the back at an angle of about 45 degrees and its inferior angle was rotated toward the midline. When the patient attempted to raise her arm, the scapula flared out from the back at approximately a right angle and the greater the effort made to extend the arm, the more pronounced this displacement became.

The second case was that of a man, 21 years of age, suffering from progressive muscular dystrophy.

Winged scapula is a condition in which the inferior angle of the scapula flares out from the body at approximately a right angle to the coronal plane when the arms are extended anteriorly or abducted. The condition is usually associated with inability to raise the arm on the affected side above, or even to, the level of the shoulder, although the patient may be able to throw it up above the head and maintain it there once the position is attained.

The immediate cause is paralysis which may involve only the upper digitations of the serratus magnus, may be limited to the serratus magnus, or associated with paralysis of other muscles. Its causes are:

1. Trauma to the long thoracic nerve by puncture or incised wounds, extensive dissections in the axilla, blows on the root of the neck, pressure incident to carrying heavy loads on the shoulder, pressure due to catching of the nerve between the coracoid process and the first rib in excessive forward rotation of the shoulder, or repeated or long-continued contraction of the scalenus medius.

2. Infectious or toxic neuritis of the long thoracic nerve, due to diphtheria, la grippe; rheumatism, or anterior poliomyelitis.

3. Hysteria. A few cases have been described in which it was suspected that the lesion was purely functional.

4. Systemic disease such as progressive muscular dystrophy, particularly of the juvenile type.

The diagnosis is made upon the history and the results of physical examination.

The prognosis depends primarily upon the etiology. Winged scapula occurring in progressive muscular dystrophy never disappears spontaneously. When due to section of the long thoracic nerve, it is usually permanent, though in 90 per cent of the cases functional use of the extremity is regained through vicarious activity of the muscles of the shoulder remaining after the loss of the serratus magnus. In winged scapula occurring from other causes there is almost always complete restoration of anatomical and functional integrity without special treatment, though occasionally severe contusions of the long thoracic nerve may result in permanent loss of function.

Since the majority of cases become cured spontaneously, there are left but two very small groups for which special treatment is desirable. The first of these groups includes cases in which the condition appears in progressive muscular dystrophy, and the second, cases in which it results from sectioning, rarely contusion, of the long thoracic nerve.

In the vast majority of instances the treatment should be expectant. For the operative treatment, a number of procedures have been proposed, such as neuroplasty, scapula fixation, and muscle transplantation.

Neuroplasty consists in anastomosing the distal end of the long thoracic nerve to the proximal end of the short subscapular nerve. This is to be done when anastomosis between the proximal and distal ends of the long thoracic nerve itself is found to be impossible.

Scapula fixation and muscle transplantation have not been particularly satisfactory. Various attempts have been made to fix the scapula by cutting off its inferior angle, freeing the subscapularis and infraspinatus muscles, and stitching them to the fascia of the back, but they have not resulted in an improvement of the patient's condition. The



author tried this method on his second case two years before this article was written, and while the patient states that he is no worse than he was before, he is no better.

The author's first patient was not operated upon because it was thought that a complete return of function would probably occur in a few months.

G. W. HOCHREIN.

**Nixon, J. A.: Remarks on Chest Wounds.** *Brit. M. J.*, 1919, i, 399.

In the early stages of chest wounds the physician's first work is to help the surgeon select cases which require and are fit for immediate operation and resuscitation.

Indications for immediate operation are: (1) hæmorrhage, (2) injuries of the diaphragm, (3) open pneumothorax, (4) "stove-in" chest, (5) retained missiles, bone, or clothing, and (6) early acute infection. The patient may be unfit for operation because of: (1) intrathoracic injuries, (2) the severity of external or complicating wounds, (3) loss of blood, and (4) collapse or shock due to cold and transport.

The physician must decide as to the intrathoracic injuries and form a definite opinion as to whether there is sufficient pneumothorax, hæmothorax, collapse of the lung, laceration or hæmatoma of the lung, or injury to the heart, pericardium, great vessels, diaphragm, vertebræ, or spinal cord to account for the severity of the symptoms.

The patient may be unfit for any immediate surgical procedure save one of the following: (1) immediate and rapid operation for the arrest of visible hæmorrhage from the chest wall or thorax; (2) the arrest of hæmorrhage from co-existing wounds; (3) aspiration for the relief of pneumothorax; (4) aspiration for the relief of hæmothorax; or (5) temporary closure of open pneumothorax.

Apart from one of these procedures nothing else remains than measures for resuscitation. As a rule, it is injudicious to aspirate immediately for pneumothorax or hæmo-thorax.

In order to decide whether or not a patient needs immediate operation, the extent of the thoracic injury must be estimated. If the patient is profoundly collapsed or in great respiratory distress on arrival at the casualty clearing station, the following possible causes should be considered:

**Hæmorrhage:** This may have been profuse and may still continue. With closed hæmothorax the amount of intrathoracic hæmorrhage is usually not enough by itself to produce severe shock. When there is an open thorax, the estimated size of the hæmothorax is not a guide to the quantity of blood lost.

**Comminuted fractures of the ribs, scapula, or sternum:** These produce the gravest symptoms even in the absence of severe intrathoracic trauma. It is of the utmost importance in such cases to determine the extent of the intrathoracic or pulmonary injury.

**Injuries of other parts of the body:** Careful attention has always to be paid to injuries other than purely thoracic injuries, such as those of the diaphragm and abdominal viscera. A prompt decision must be made as to whether or not there is sufficient thoracic injury to produce the symptoms, or whether the intrathoracic injury may be ignored and a further explanation looked for below the diaphragm. All spinal injuries demand recognition, not merely those which involve the spinal cord itself. Injuries to the vertebræ may cause the gravest symptoms. Profound collapse which resists all efforts at resuscitation is often observed in spinal injuries even when the cord is undamaged.

**Open thorax:** The distress caused by an open thorax is often very great, and until the opening has been closed it is difficult to estimate the extent to which the symptoms are due to injury to the thoracic contents. Auscultation and percussion add little information to what can be seen. Active hæmorrhage may be visible externally.

In cases of closed thorax the examination of the chest resolves itself into a combination of the ordinary physical methods with radioscopy and radiography.

The author takes up the methods of examining the chest by inspection, palpation, percussion, auscultation, etc., and goes into detail regarding the various signs of injury, their value in diagnosis, and how at times they may be misleading.

It is impossible to treat chest wounds adequately without the X-ray. The position of the heart and diaphragm and their movements, damage to the lung, collapse of the lung, hæmothorax, and pneumothorax, can be accurately determined only by the X-rays in conjunction with the physical signs. Radiography is insufficient; the patients must be examined also radioscopically, and the parts seen in movement with the fluoroscopic screen if possible while they are in the sitting position.

All wounds of the parietes and thoracic contents should receive the surgical attention they require at the earliest possible moment. Hæmorrhage must be arrested and every possible step taken early to avert infection. No fluid, whether blood, serum, or pus, must be allowed to collect in the chest. Fluid in the chest is dangerous for it is a nidus for sepsis and interferes with expansion. Foreign bodies—metal, clothing, and bone—should be removed whenever possible.

Resection and open drainage as formerly practiced for emphysema is an unsatisfactory operation and has been shown by the experience in this war to be rarely necessary if early treatment according to modern methods is not neglected. V. C. HUNT.

**McGuire, W. A.: Hæmothorax Following Gunshot Wounds of the Chest.** *J. Am. M. Ass.*, 1919, lxxii, 1269.

The death rate from chest wounds during previous wars was as follows: Civil war, 62 per cent; Crimean war, 90 per cent; Spanish-American war, 27 per



cent. Statistics for the recent war show wide variations. Some place the mortality rate as low as 10 per cent, others as high as 20 per cent. The author states that chest wounds comprised 2 per cent of all casualties; one-half of these were due to rifle and machine-gun bullets.

Of 300 men who died on the battle field, 112 had fatal chest wounds. In the casualty clearing stations and evacuation hospitals the mortality was 40 per cent, while in the base hospitals it was variously reported as 8 per cent, 4 per cent, and 27 per cent.

The anatomical causes of death according to their frequency were hæmorrhage, double pneumothorax, shock, œdema of the lung, and complicating injuries to other parts. Sepsis also was responsible for a number of deaths. According to Soltau, 48 per cent of deaths were due to gas-producing organisms, 40 per cent to streptococci, and 12 per cent to pulmonary organisms.

Fracture of the ribs was an infrequent complication. Unilateral pneumothorax occurred most often after injuries by shell fragments. The most common complication was hæmorrhage which was found in 80 per cent of the cases of chest injury.

Both lung collapse and hæmorrhage may occur without perforation of the thorax, and an ordinary tangential wound may be responsible for both.

By questioning more than 50 patients with lung perforations to learn the immediate symptoms, the following information was obtained. When hit by a rifle or machine-gun bullet a light blow was felt in the chest or back. Those sustaining shrapnel injuries felt a heavy shock-like blow and were forcibly thrown to the ground. Pain was the first symptom noticed and was only moderately severe; it increased with each respiration and referred directly to the site of the wound. In 10 per cent of the cases the pain was referred to the shoulder, and in only one case, to the upper abdomen. Most of the patients were able to walk from 100 yards to 3 miles after the injury. Ten per cent experienced nausea and vomiting. Only one became unconscious, but all experienced faintness in varying degree. Dyspnoea was the most common symptom and was present not only in cases of penetrating chest wounds but also in cases of tangential wounds. Cyanosis was not a marked or constant symptom. Hæmoptysis occurred in 90 per cent of the cases and lasted not longer than four days.

The treatment these men received in a base hospital was as follows: in 22 of 25 cases there was a simple debridement of the wound of entrance and removal of the foreign body when it was accessible, and in 3 cases a radical operation in which the lung was exposed, the foreign body and the clot removed, and the wound closed in layers. Of the 3 latter patients, 2 developed infection necessitating subsequent rib resection and drainage.

Eleven of the sterile wounds were perforating wounds due to machine-gun bullets or tangential wounds. The patients had slight dyspnoea on exertion, but the physical and X-ray findings were

negative or nearly so. In 11 other sterile cases there were varying degrees of hæmothorax. In these instances the symptoms consisted of: (1) dyspnoea, which depended upon the degree of lung collapse and the amount of fluid and appeared only on exertion; (2) slight cough and expectoration; (3) an average evening temperature for ten days of 99.4, regular and constant; (4) a moderately increased pulse rate; and (5) respirations ranging from 19 to 23.

On physical examination flatness which did not always shift when the patient's position was changed was found on percussion when the blood had clotted after varying periods. Auscultation gave conflicting and misleading information. The leucocyte count averaged 11,000, with 72 per cent polymorphonuclear leucocytes.

In infected cases the pain was very severe and there was marked dyspnoea even when the patient remained quiet. Cough and expectoration were moderate and usually occurred at night. The temperature ranged from 100 to 103, with irregular excursions. The pulse was rapid in all, and there were the usual signs of sepsis. The treatment of these patients consisted of rib resection and free drainage.

The author emphasized the fact that the fluoroscope had been an invaluable aid in the differential diagnosis and management. V. P. DIEDERICH.

**Beck, E. G.: What Shall Be Done with the Open Chronic Suppurations of the Chest Cavity?**  
*Med. Rec.*, 1919, xcv, 770.

Stereoscopic roentgenograms of the chest are of great value in determining the cause of chronic suppurations.

The author demonstrates by plates how the cavities are easily outlined by injecting into them bismuth-vaseline paste consisting of 10 parts of bismuth subnitrate to 90 parts of vaseline. The plates show also that changes of position give valuable information as to drainage, as the paste settles in the cavities. Bronchial communications are indicated when the paste is coughed up. Great care should be taken in these cases and the mixture used should be liquid.

In many cases of tuberculous origin no tubercle bacilli were found in the pus before the injection of the paste, but after its injection were discovered in large numbers.

For the location of foreign bodies in the chest, which are often the cause of these chronic suppurations, the author uses a stereo method he described in 1917.

At least four out of five of the very old cases may be cured by repeated injections of the paste continued for several months. In some instances the sinus remains closed for a year or two but finally reopens. The injections should then be repeated. The sinus will close again but may reopen after a period of a few years. In spite of these reopenings, however, the author believes this method



is best and the patient will consent to it rather than to the radical operation.

Cavities holding more than 200 grams and those with communicating bronchi are less likely to heal by this method. When the discharge continues to be purulent, more radical procedures are necessary. In the one case out of five in which there may be no tendency to heal by the method described the author uses his skin-sliding operation in preference to the Estlander or Schede operations.

V. P. DIEDERICH.

**Green, J. R.: The Physiology of Respiration in the Treatment of War Wounds of the Chest and Empyema.** *J. Am. M. Ass.*, 1919, lxxii, 1356.

From evidence compiled from clinical observations in war wounds of the chest, the author makes the following generalizations:

1. Respiration is re-established in a collapsed lung only when the movements of the diaphragm are established as rhythmic contractions.

2. The lung in expanding forces itself into an large, open wound of the chest wall, not seldom and accidentally, but very often. This occurs in the presence of full atmospheric pressure which opposes the protrusion and the root of the lung is pushed further laterally than normal from the open thorax wound.

3. The diaphragm is vital in the production of the respiratory reflex because wounds of the diaphragm if unrepaired always produce death, even though the muscle is situated so that its contraction makes an air-tight and water-tight valve which insures a perfect piston action. The cause must lie in a disruption of its co-ordinating mechanism similar to fibrillation in the heart muscle.

The conclusions from experimental work are:

1. The extent of lung expansion is in direct proportion to the amplitude of the contractions of the diaphragm.

2. Collapse of the lung is a defensive reflex to preserve the normal temperature of the blood.

3. The first expansile effort on the part of the lung when the thorax is opened is a natural effort to plug the thoracic opening.

4. Both expansion and collapse, as defensive reactions, are merely exaggerated uses of the normal lung reactions to meet conditions of changing temperature. The adaptation to higher temperatures under normal conditions is made by sighing and gasping; temperatures too low call for a lessening of the respiratory movements.

E. B. FREILICH.

**McDuffie, M. W.: Postinfluenzal Empyema.** *N. York M. J.*, 1919, cix, 766.

On the basis of reports from various parts of the country in regard to influenza and pneumonia, McDuffie concludes that empyema in some form occurs in about 5 per cent of the cases and is nature's method of freeing the blood-stream of the invading organism.

He would divide cases of empyema into two distinct divisions, those with and those without bronchial connection. In the diagnosis the physical findings, the X-ray, and the aspiration needle are of the utmost importance. When the pus pocket is not in contact with the chest wall, the diagnosis is more difficult. Thoracic paracentesis is the most reliable diagnostic procedure, but may fail when the walls of the cavity are covered with a thick coat of fibrin, or when the pus itself is viscid. Subphrenic abscess, new growths, and serous effusions must be differentiated. Aspiration is best for infants under 2 years of age, the most desirable point of aspiration being the interspace between the ninth and tenth ribs, either in the axillary or the mid-scapular line.

As an anæsthetic for operation in empyema nitrogen gas and oxygen have given the most satisfaction. Procedures under local anæsthesia are warranted only in emergencies.

All methods of operating are greatly excelled by anterior incision which has the following advantages: first, freedom of approach; second, less difficulty in operating; third, the presence of a greater amount of periosteum; fourth, better control of drainage; and fifth, more satisfactory end-results to the patient. The steps of the operation cannot be stated more clearly than has already been done by Pierre Duval. The author, however, prefers making the incision at the ninth rather than the fourth rib.

E. C. ROBITSCHER.

**Gray, H.: Pneumonia and Empyema.** *Boston M. & S. J.*, 1919, clxxx, 475.

This article is a continuation of a series dealing with cases of pneumonia and empyema treated at the base hospital at Camp Devens, Mass. Of 485 cases of pneumonia cared for during a period of thirty-five weeks, 88 per cent were primary cases, 8 per cent were due to an attack of measles, and 4 per cent followed ether anæsthesia. The onset was abrupt in only one-third of the cases. Usually the diagnosis was not made until the fourth day. Of the total number of patients, 16 per cent developed empyema, a complication which raised the mortality from 13 per cent to 44 per cent. Fifty-three per cent of the cases of empyema were due to the hæmolytic streptococcus. More than half of the patients developed a transient nephritis.

The author suggests that a definite diagnosis might be made earlier by (1) careful observation of the temperature and respiration of all patients who have "common colds" or measles and who have taken ether, (2) daily inquiry as to chest pain, (3) careful daily examination of the chest, (4) an X-ray picture, and (5) early sputum examination in all suspected cases. The attention of medical officers should be called to the importance of suspecting all cases of pain in the chest or abdomen and referring them to the hospital for observation for pneumonia. The presence of effusions could be diagnosed earlier by a search for muffled breath



sounds, especially "rasping," signs of extending unilateral dullness, or evidence of prostration. Any one of these three is an adequate indication for exploratory aspiration. An essential part of the treatment during convalescence is graded military exercises continued for a considerable period of time.

E. M. MILLER.

**Philips, H. B.: Empyema at Camp Mills, L. I., with Special Reference to the Use of the Philips Empyema Apparatus.** *J. Am. M. Ass.*, 1919, lxxii, 1274.

The author reviews the results obtained with various methods at Camp Mills, L. I., in the treatment of empyema, and refers especially to those achieved with his apparatus.

Seventeen cases were treated with simple aspirations repeated at three- to seven-day intervals or as conditions indicated. Three patients were cured, two died, and the rest were later treated by one of the other methods. Simple aspiration very often caused pneumothorax.

Intercostal drainage was used in ten cases and in this group the mortality was 30 per cent. There were two complete cures after six weeks of treatment. The intercostal drainage was effected by the insertion of various improvised cannulas and tubes connected with suction bottles. No irrigations were used.

Rib resections were done in twelve cases. Seven of these patients had received repeated preliminary aspirations. One of them died. Of the eleven remaining, two have been cured and all others had been draining from nine to eleven weeks when the report was written. Of this series, those who had received the preliminary aspirations appeared to stand the rib resection better than the others.

The Philips apparatus was used in sixteen cases. Five patients died while still suffering from pneumonia. In two cases closure was effected in ten and twenty days, respectively, but reopening was necessary. Two cases were cured in ten and twenty-one days respectively.

V. P. DIEDERICH.

### TRACHEA AND LUNGS

**Brau-Tapie: Eleven Cases of Pulmonary Suture in War Wounds of the Lung** (Sur onze cas de sutures pulmonaires pour plaies de guerre du poumon). *J. de méd. de Bordeaux*, 1919, xc, 50.

In 63 cases of thoracic perforations due to war projectiles an operation to extract the projectile and cure the lung lesions produced by it radically was indicated in 11. Six of these patients recovered. In 5 cases the wounds healed by first intention. There were 5 deaths, 1 due to hæmorrhagic shock, 1 to liver toxæmia, 1 to purulent pleurisy, and 2 to acute septicæmia. The majority of these patients were hæmorrhagic and some of them in a bad condition of shock. Transfusion was resorted to in only 1 case and gave negative results.

The operation consisted of a preliminary thoracotomy, the third or fourth rib being resected for a distance of about 5 centimeters. In several of the cases, however, the suture of the torn lung was done through the orifice created by the projectile. After the suture of the lung and the evacuation of blood and clots from the pleural cavity, the anæsthesia was momentarily suspended and the cavity washed out with ether. The character of the pulse and respiration was not affected by this. The clinical histories of the 11 cases are given in detail and illustrated.

The conclusions drawn by the author on the basis of his results were:

1. Under favorable circumstances operation is indicated principally when (1) the pulmonary hæmorrhage continues, and (2) the embedded projectile is as large as, or larger than, a nut.

2. A priori thoracotomy is necessary whenever there is doubt as to the practicability of reaching the pulmonary wound or the projectile by the orifice of entry of the projectile and surgical intervention should be always complete.

3. Every aid afforded by the laboratory should be utilized whenever possible.

4. A hæmothorax after operation should be punctured on the fourth or fifth day.

W. A. BRENNAN.

**Fullerton, A.: Missiles as Emboli.** *Lancet*, 1919, ccxvi, 913.

The patient, a soldier, had been hit with a rifle or machine-gun bullet a few hours before he was admitted to the clearing station. Immediately after the injury he complained of difficulty in breathing. On admission to the station he was somewhat cyanosed and dyspnoic, and his pulse was small and rapid. He was not cold or blanched. The wound of entrance of the bullet was situated in the left loin 2 inches from the spinous processes, at the level of the highest point of the iliac crest. Examination with the X-ray showed that the missile was retained 4 inches below a pencil mark on the skin over the anterior surface of the chest wall, at the level of the juncture of the second costal cartilage with the sternum and three fingers' breadth to the right of the sternal border. Death occurred eleven and one-half hours after the receipt of the injury.

A postmortem examination was performed the same day. The track of the bullet showed that the latter had passed through the transverse mesocolon, the stomach, the left lobe of the liver, the diaphragm, the posterior surface of the right ventricle (small puncture), and one of the cusps of the auriculo-ventricular valve, and had entered the upper main branch of the right pulmonary artery where it had been arrested. Blood (about 8 ounces) was found in the pericardial sac, and extravasated stomach contents in the peritoneal cavity. The right lung was collapsed although it was not involved by the wound.



## HEART AND VASCULAR SYSTEM

**Butler, E. F.: Stab Wound of Heart: Suture of Heart Muscle with Recovery.** *J. Am. M. Ass.*, 1919, lxxii, 1283.

The author reports the case of a man 42 years of age who was brought to him suffering with a stab-wound of the heart which had been inflicted with a butcher knife.

Following his injury, the patient had been able to walk across the street. When he reached the hospital a short time later he had marked dyspnoea which was increased on lying down, pain in the precordial region which was increased by respiratory movements, and a pulse of 80 which was regular and of low volume and tension. Over the costal cartilage of the fifth rib on the left side and 6 cms. from the midline was a wound 2 cms. long.

Four and one-half hours after the accident, the wound was excised and the skin margins resected with the patient under local anæsthesia. A general anæsthetic was then given, and 12 cms. of the fifth rib which had been severed were resected. The left pleural cavity was opened and found to contain about 100 cc. of blood. No injury of the collapsed lung could be seen. The wound in the pericardium, which was 1 cm. long, was made 4 cms. long. In the pericardial cavity was a slight amount of clotted blood. In the left ventricle was a wound 1 cm. long, but not penetrating the cavity. It bled rather profusely and in spurts synchronous with the heart beat.

The wound in the heart muscle was closed with two catgut sutures and the chest wall closed in layers with a drain to the pectoral muscles. Four days later the patient's pulse and temperature were normal.

V. P. DIEDERICH.

**Delorme, E.: The Operative Technique of Cardiolyse** (Technique opératoire de la cardiolyse). *Lanc. franc.: Gaz. d. hôp.*, 1919, xcii, 357.

By "cardiolysis" Delorme means the destruction of cardiopericardiac adhesions. This term therefore should not be confused with "pericardiolysis," which is the destruction of the thoracic wall in the cardiac area. In Delorme's opinion, cardiolysis has earned a place in surgical therapeutics.

After a chondrocostal exploration the author makes an incision from the fourth to the sixth rib. A grooved sound or the finger is then pushed behind the deep surface of the sternum to separate the external surface of the pericardium from the pleural culs-de-sac. The pericardium is incised for the whole length of the operative wound and the cardiolysis effected with the fingers and the end of a curved scissors. If in sectioning the pericardiac adhesions an excessive resistance is met with, especially in the non-accessible parts, it is best to stop. If the adhesions are too intimate to permit separation, the intervention should be limited to freeing the pericardium from its anterior diaphragmatic attachments.

Cardiolysis is indicated in cardiac symphysis of rheumatismal origin with dilatation and hypertrophy, and in tuberculous symphyses.

As the destruction of cardiopericardiac adhesions is much more easily accomplished soon after the adhesions are formed, the operation should be done as early as circumstances permit. It should be remembered that the thinness of the heart muscle precludes any action upon it if the adhesions are not new and loose.

Recent advances in radiology have transformed the diagnosis of both total and partial cardiac symphyses, and the late war, owing to the many operations for the removal of intracardiac projectiles, has established many valuable clinical findings. The apprehension with which surgeons formerly approached cardiopericardiac interventions has been removed to a great extent by recent advances. If the nature and the degree of the trouble in the circulatory system due to the presence of pericardial adhesions can be definitely determined and are of sufficient importance, there appears to be no reason why a prudently conducted operation should not be undertaken.

W. A. BRENNAN.

## PHARYNX AND ŒSOPHAGUS

**Kelly, A. B.: Discussion on Dilatation of the Œsophagus without Anatomical Stenosis.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 48.

In his discussion on dilatation of the Œsophagus Kelly states that the preliminary part of the treatment of cardiospasm is carried out by the aid of direct inspection. The technique he uses and the observations that he considers of most importance are briefly as follows:

1. For the first examination a general anæsthetic is used. Otherwise the strain might aggravate the disease.

2. In introducing the tube more resistance than usual is encountered near the mouth of the gullet. This observation and the fact that the patients often refer their dysphagia to the cricoid region indicate that obstruction at the cardia may be associated with spasm at the upper end.

3. The patient lies on his back with his head slightly lowered as this is the best position for the examination of the cardiac end and aids drainage which begins as soon as the tube enters the gullet.

4. After the gullet is thoroughly cleaned, the hiatal and subhiatal regions are examined. The first point to be noted is the distance of the hiatal gullet from the upper teeth. The average distance in males is 40 cm., and in females, 39 cm.

In most of the author's cases the lumen of the hiatal portion was surrounded by a stellate arrangement of folds of mucous membrane; in others it was V-shaped or merely a slit with a prominent cushion in front and behind. The size of the lumen was constantly changing on inspiration and expiration. This appearance and movement were observed with the end of the tube 3 centimeters above the



hiatal level and are given as normal. As soon as the tube was introduced so that it came into contact with the parts around the hiatus, however, the lumen was at once closed and remained closed until the tube was withdrawn a few centimeters when the opening and closing began again.

This observation was made repeatedly and was proved to be peculiar to patients suffering from cardiospasm. According to the experiments reported, such patients have a considerable area of hyperæsthesia in the gullet and it is to this that the cardiospasm is due. The etiology of the hyperæsthesia is unknown.

After a consideration of the different remedial agents for the relief of cardiospasm, the author gives in detail his method of using Gottstein's instrument which affords relief in all cases and effects a cure in many.

J. J. HOMPES.

**Worthington, R.: Dilatation of the Oesophagus without Stenosis.** *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Laryngol., 95.

Worthington reports the case of a woman 34 years of age who had suffered from difficulty in swallowing

for two years. During that time she had lived almost entirely on milk, but occasionally was able to swallow more solid food.

Examination of the oesophagus showed that it was dilated and contained milk curds and a partially macerated piece of meat about 1 inch long which appeared to have been lodged there for some time.

After the oesophagus was emptied, the author was surprised to find that a large-sized bougie could be passed into the stomach with ease.

The following day the patient's ability to swallow was much improved and she declined further treatment.

A report received from her later, however, stated that she speedily relapsed into her previous condition. Occasionally she has crises lasting for several days when she is unable to swallow anything at all, and during the intervals she lives entirely on milk.

This case disproves the contention put forward a few years ago that there is no such condition as spasmodic stricture of the oesophagus.

J. J. HOMPES.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Trick, H. R.: Dynamics of Abdominal Herniæ.** *N. York J. Med.*, 1919, xix, 166.

No operation yet designed is proof against recurrence, and because of the inherent mechanical faults of our anatomy rather than faulty technique, it is not likely that any operation will be developed that will guarantee 100 per cent of cures.

The generally recognized causes of abdominal herniæ are: (1) contributing causes, such as developmental defects, ascites, tympanites, abdominal tumors, etc., and (2) active or exciting causes, such as coughing, sneezing, violent exercise, etc.

Intra-abdominal pressure is the mechanical equilibrium between the abdominal wall and the organs it encompasses, that is, static or potential energy. In increased intra-abdominal pressure there is a loss of this equilibrium. Since normally there is no air or fluid in the abdominal cavity, the term "increased intravisceral pressure" would seem to describe the situation more literally.

Tympanites from an obstruction of the bowel increases the intra-abdominal pressure, but does not cause a hernia as a distended bowel does not adapt itself to the slits through which it must pass in order to become a hernia. Neither is an absolutely collapsed bowel likely to produce a hernia. Ascites may develop a sac but does not make a hernia unless some organ is forced into the sac. Most apt to produce an abdominal hernia it would seem would be a condition midway between distension and collapse of the bowel.

The author suggests the manner in which a hernia may be formed. When a loop of flaccid bowel located opposite the internal or femoral ring or some other weak spot is suddenly exposed to concentric compression by the violent contraction of all the abdominal muscles, a diverticulum of the bowel is forced through the weak spot and its size increased with each repetition of the condition. This theory applies equally well to all varieties of abdominal hernia. The sac, which is the only part of a hernia that may be congenital, may have been developed by the application of the same forces in intra-uterine life. The proper treatment of hernia, therefore, becomes a matter of applied mechanics.

The author discourages the use of the truss except when surgical treatment is contra-indicated. For the radical cure he advises operation in which the repair of the transversalis fascia is of great importance.

V. C. HUNT.

### GASTRO-INTESTINAL TRACT

**Razzaboni, G.: Subtotal Gastrectomy for Pseudo-neoplastic Gastric Tuberculosis** (*Gastrectomia subtotale per tuberculosi gastrica a forma pseudo-neoplastica*). *Policlin.*, Roma, 1919, xxvi, sez. chir., 153.

The case reported was that of a woman aged 60 years. The condition was diagnosed as gastric carcinoma and a laparotomy was performed. The greater part of the stomach wall except the region of the cardia was found to be involved by a diffuse tumorous mass. This mass and the omental



adhesions were removed en bloc by the Billroth II method with gastro-intestinal anastomosis.

Subsequent examination of the resected mass showed the lesions to be inflammatory and not neoplastic. While the histological data were not sufficient in themselves to establish its exact nature clearly, there was lymphoid infiltration and the presence of giant cells. The Koch bacillus could not be isolated from the specimens directly but animal inoculation gave positive results for tuberculosis.

The characteristics of the lesions were the same as those described by Poncet and Leriche as inflammatory tuberculosis.

The diagnosis of gastric tuberculosis is always very difficult and usually is established only by examination of an excised specimen. The patient in this case gave no history of the disease.

W. A. BRENNAN

**Urrutia, L.: The Surgical Treatment of Gastric Ulcer and Its Complications** (Tratamiento quirúrgico de la úlcera gástrica y sus complicaciones). Monograph, San Sebastián, 1919.

Urrutia reports 219 cases of ulcer (128 gastric; 88 duodenal; 1 gastrojejunal; and 1 jejunal) operated upon at San Sebastian from September, 1914, to March, 1919. There were 15 operative deaths, a total mortality of 6.8 per cent.

The monograph gives a historical review of the surgical treatment of gastric and duodenal ulcers and a criticism of the different techniques.

Urrutia's conclusions are:

1. A simple gastro-enterostomy alone is indicated in purely cicatricial pyloric stenoses. When there is also an active ulcer, as in the majority of cases, a pylorectomy ought to be performed.

2. In gastric ulcers situated anywhere except in the cardia an extensive pylorogastroectomy should be performed and followed by a rectocolic gastro-enterostomy or an end-to-side gastrojejunostomy. In exceptional cases, however, an annular resection followed by end-to-end anastomosis will be necessary.

3. In cases of duodenal ulcers which cannot be excised, gastro-enterostomy should be combined with resection of the pyloric antrum, unilateral exclusion or sphincterectomy being reserved for special cases.

4. With correct technique, the mortality following these operations should not be higher than that of simple gastro-enterostomy and the ultimate results should be much better.

5. The method of choice in mediogastric stenoses is annular or pylorogastric resection.

6. In acute perforations an immediate operation will save life in the majority of cases.

7. In subacute or covered perforations operation is called for in every case.

8. In profuse hæmorrhages due to gastric or duodenal ulcers the results of medical treatment are much superior to those obtained by surgery. An

operation should be performed in such cases only in quiescent periods or when there is chronic hæmorrhage.

W. A. BRENNAN.

**Wall, J. S.: Pyloric Stenosis of Infancy.** *Arch Pediat.*, 1919, xxxvi, 193.

The author deals only with the hypertrophic variety of pyloric stenosis. In discussing the etiology of the condition he states that from the standpoint of embryology it is possible that the stenosis is due to a temporary obturation of the lumen of the duodenum which is apparently a normal stage of evolution in the foetus from 12 to 15 millimeters long. Whether or not, however, the persistence of such an intestinal block would lead to hypertrophy of the adjacent sphincter is within the realm of speculation. Downes believes there is an abnormal thickening at birth, and the effort necessary to force food through the narrowed pyloric lumen produces circulatory disturbances which result in œdema. Many believe that the condition is associated with enlargement of the thymus gland, but sufficient observation has not been made to confirm this opinion.

Pyloric stenosis is a disease of serious import and failure to recognize it is almost inexcusable. The symptoms are: (1) vomiting of the projectile type in large quantities which begins usually between the second and fifth weeks, rarely earlier or later, and as a rule occurs after each nursing though often several feedings are retained during the day and all are vomited at once; (2) a loss of weight amounting to 3 or 4 ounces a day, and later, as much as half a pound; (3) stools which at first are dark brown but later become tarry and resemble meconium; (4) scantiness of urine; and (5) dryness of the skin.

The chief physical characteristics are as follows: (1) peristaltic waves which appear as spherical gas balls or miniature balloons under the left border of the ribs and pass slowly toward the right, usually above the line of the umbilicus, and (2) possibly a pyloric tumor which, if present, is usually of great importance and can be palpated as a movable body the size of a small olive, 1 inch or more to the right of the umbilicus. The degree of emaciation depends entirely upon the stage of the disease and therefore in many of the milder cases cannot be depended upon as a diagnostic point.

The treatment of choice is operation unless the case is of a very mild type and the best hospital facilities for medical treatment are available. The operation described by the author is the Rammstedt pylorotomy. An incision is made in the long axis of the bowel through the enlarged circular muscle fibers down to the mucous membrane, care being taken to avoid injuring the mucosa. This relieves the pressure of the tumor on the pyloric lumen and allows the muscular coats to retract.

A pathologic study made of a case six months after operation showed that retraction of the muscles permitted the opening to gape, and that



the space had been filled with organized tissues. The pyloric lumen was dilated and performed its function well, demonstrating that the operation was efficient. The tumor mass which was plainly visible at operation had disappeared.

E. A. PRINTY.

**Peple, L.: Congenital Pyloric Stenosis. Comparison of Operative Procedures for Its Relief, and a Contribution to the Technique.** *Virginia M. Month.*, 1919, xlv, 25.

The symptoms of congenital pyloric stenosis usually begin from the second to the fourth week, and their onset is gradual. In an infant otherwise not ill there is persistent vomiting after the ingestion of food, distinctly visible peristaltic waves from the cardia to the pylorus, a decrease in the size and frequency of the stools, and an olive-shaped mass which may be outlined.

The two most frequent operative procedures for the condition are posterior gastro-enterostomy and pyloroplasty. To the former there are many objections. The author prefers the Rammstedt pyloroplasty because it is simple, may be performed in a short time, and there is little danger from hæmorrhage.

Four cases are reported, in two of which a posterior gastro-enterostomy was done, and in two, a Rammstedt operation. All the patients recovered. In cases of this kind the author uses a special table which rests on the regular operating table and contains a compartment for hot-water bottles.

I. E. BISHKOW.

**Hendon, G. A.; Duodenal Fistula; with Report of a Case.** *South. M. J.*, 1919, xii, 199.

Careful search of available literature reveals the record of only a few cases of duodenal fistula. When the anatomical location of the duodenum, and especially the proximity of the retroperitoneal fixed portion to certain other intra-abdominal viscera is considered, it seems remarkable that this portion of the bowel so frequently escapes injury during operations for hepatic, renal, gastric, and cholecystic pathology. On the other hand, duodenal fistula may result from a minute perforating ulcer. If such a fistula is recognized sufficiently early, it should be amenable to treatment by the intelligent application of modern therapeutic principles.

The author reports the case of a patient, 70 years of age, upon whom nine years previously a cholecystostomy had been performed. Early in 1917 he again suffered from attacks of epigastric colic for which the author performed a cholecystectomy. Symptoms of common-duct obstruction followed the operation, and four months later a drain was inserted into the cystic duct with the idea of making a permanent fistula. As this opening closed, a second attempt was made two months later. During the course of the operation there was a gush of thin, viscid material mixed with bile. The next day

copious discharges of duodenal contents began. The skin was protected with a rubber dam, and the fistula packed daily with gauze strips saturated with compound tincture of benzoin. Within five weeks from the date of the last operation the fistula had entirely closed, and the patient has remained in good health ever since.

In 1914 Mayo reported three fatal cases of duodenal fistula following right nephrectomy, death occurring within two weeks. In 1915 the same author reported a successful closure of a duodenal fistula following right nephrectomy.

Palmer records two cases of duodenal fistula cured by expectant treatment, which he says has several objects: (1) the protection of the skin, (2) the introduction of fluids and nourishment in quantities sufficient to maintain not only life, but also the reparative power of the tissue, (3) a reduction in the amount of the gastric and intestinal excretions, and (4) the neutralization and dilution of these excretions. As protective measures he recommends paraffin with a low melting point applied hot to the skin, or a solution of pure gum rubber in benzine. To supply fluids, 10 per cent glucose solution with sodium bicarbonate may be administered per rectum. Acid-producing food must be avoided and alkalies given instead. Atropin and epinephrin have an inhibitory effect on the gastric excretion. Milk, fats, and oils may be used.

V. C. HUNT.

**Cannaday, J. E.: Long Resections of Intestine.** *Ann. Surg.*, 1919, lxix, 425.

The small bowel varies from 15 feet, 6 inches to 31 feet, 10 inches in length, the average length being greater in the female. The large intestine varies in length from 3 feet, 3 inches to 6 feet, 6 inches. People who have for generations subsisted largely on a coarse vegetable diet have a longer intestinal tract than those who have lived on more concentrated food. The removal of the large bowel seems to interfere little with the general bodily nutrition, but after resection of considerable lengths of the small intestine, it is necessary to husband the patient's physiological resources carefully. It has been found rather generally, however, that patients survive in a fair state of health after the removal of even half of the small intestine.

The author reports a case in which it was necessary to resect 300 cm., (10 feet) of the small intestine and the cæcum, including 20 cm. of the ascending colon, owing to extensive ileocaecal tuberculosis. After a rather stormy convalescence during which it was necessary to reopen the abdomen twice, the patient made a good recovery and left the hospital at the end of the fourth week. At this time the average number of stools a day was three. About two months after operation he returned with a severe cold and died shortly afterward with the symptoms of acute tuberculosis. The postmortem examination showed that, with the exception of a few adhesions in the location of the former drainage



tubes, the abdomen was in excellent condition. The small intestine up to the duodenojejunal juncture was found to be only 5 feet, 7 inches in length while the large bowel measured 4 feet, 9 inches. There were no visible signs of visceral tuberculosis.

Fantino has suggested that in cases of extensive resection a circle be established in the remaining segment of intestine in order to keep the intestinal contents in the bowel for a longer time. According to Turck, short-circuiting is preferable to resection whenever possible and particularly if the lower ileum is involved. In the author's case, however, the involvement was too extensive.

The article is concluded with a list of cases of long resections of the intestine taken from Park, Moynihan, and others, and brought up to date.

GATEWOOD.

**Farr, C. E.: Appendicitis in Children.** *Arch. Pediat.*, 1919, xxxvi, 207.

The author draws the following conclusions:

1. Appendicitis in children is probably more common than is generally believed because of inaccuracies in the case histories and the impossibility in many cases of making a careful physical examination.

2. The apparently higher rate of mortality among children may be attributed to the fact that only severe cases are diagnosed and operated upon and that children have less resistance to infection.

3. Many case histories have shown that the progress of the disease is little, if any, more rapid in children than in adults.

4. On the basis of a series of 420 cases, it is very evident that early diagnosis and operation in the milder cases would probably decrease the mortality by half.

E. A. PRINITY.

**Downing, A. T.: Hernia of the Small Bowel into the Rectum.** *Boston M. & S. J.*, 1919, clxxx, 585.

In the case reported there was severe abdominal pain with persistent vomiting and involuntary diarrhoea suggesting peritonitis. Five days after the onset, when the patient was admitted to the hospital, the pulse was rapid and weak, the temperature 97, and the leucocyte count 14,000. The abdomen was rigid and distended and tender all over. The urine showed acetone.

At operation, the abdomen was found to contain seropus and faecal material. Examination of the appendix showed acute gangrene without macroscopical perforation and a hernia of the small bowel into the rectum.

I. E. BISHKOW.

**Chevassu, M.: The Surgery of the Left Colic Angle by Lateral Flank Incision** (*La chirurgie de l'angle colique gauche par l'incision latérale du flanc*). *Bull. et. mém. Soc. de chir. de Par.*, 1919, xlv, 614.

The surgery of the left colic angle is especially difficult because of the depth and slight mobility

of this portion of the intestine. In operations on the kidney Chevassu usually makes a lateral incision and this induced him to try it in a recent operation for the removal of a cancer of the left colic angle.

When a thin patient is placed in a dorsolateral position with a block under the lower part of the thorax, the right thigh flexed and lying horizontally upon the table, and the left leg extended in external rotation, the end of the eleventh rib will be seen on the axillary line or a little behind it. The termination of the tenth intercostal space just in front is the point at which the lateral flank incision to which Chevassu refers is begun. This incision may then be carried upward between the ribs for a distance of several centimeters without danger of opening the pleura. With the bistoury held horizontally, the flank is incised parallel to the fibers of the obliquus major so that in passing close to the point of the eleventh rib the incision opens the peritoneum in such a way that a loop of colon is immediately exposed.

In some cases this loop is mobile and is then found to be the end of the transverse colon; in others it has very little mobility and is formed by the first part of the descending colon. In any case the juxtasplic portion of the colon is exposed. A slight pulling on the afferent and efferent loops is then sufficient to draw the angle into the wound. A stroke of the bistoury on the phrenic and splenocolic ligaments then makes of the left portion of the colon a loop as mobile as the pelvic colon and as easily drawn out.

In the case of cancer reported, Chevassu made a flank incision about 10 centimeters long. When the tumor was brought into the wound it was found to be adherent by its anterior surface to the left edge of the great omentum. The involved part of the omentum was resected away. The amount of intestine exposed measured about 30 centimeters and more could have been exposed if it had been necessary.

The operation as performed in this case by Chevassu was divided into two stages. In the first, the affected loop of colon was brought to the surface and the peritoneum completely closed. When fixed to the abdominal wall it was kept covered with compresses wet with physiologic serum. The second stage consisted in the resection of the cancerous mass and was done six days later.

The facility with which the colon is reached by the lateral incision led Chevassu to believe that it might often be advantageous to replace the left iliac anus created preliminary to operation for the extirpation of rectocolic cancers by a colic anus formed at the level of the flank. He has just performed such an operation on a patient with multiple tumors of the rectum which he expects to extirpate shortly. No particular difficulty was encountered and it was not necessary to make an incision more than 5 centimeters long. In the author's opinion a colic anus has several advantages over the iliac anus.

W. A. BRENNAN.



## LIVER, PANCREAS, AND SPLEEN

**Willis, A. M.: Stone in the Common Duct; with Analysis of Fifty Cases.** *J. Am. M. Ass.*, 1919, lxii, 1343.

Probably in no other branch of abdominal surgery have greater advances been made than in the surgery for the relief of symptoms arising from the presence of biliary calculi.

While calculi do recur, i. e., new stones are formed or descend from higher levels, most of the so-called "recurrences" are in reality calculi which were overlooked at the time of the primary operation.

Calculi are present in the ductus choledochus, either alone or associated with calculi elsewhere, in a comparatively large number of patients operated upon for the relief of gall-stone symptoms. The incidence varies from as low as 4 per cent according to the older reports to as high as 20 per cent according to more recent compilations.

At least three explanations may be advanced to account for the discrepancies in the figures given by different surgeons as to the relative frequency of stones in the common duct:

1. The more skilled and experienced surgeon will detect calculi in this location when their presence would not be revealed to a less skilled operator.
2. Patients who suffer from recurrences and those with the severe symptoms generally associated with calculi in the common duct seek aid from surgeons of wide reputation. Therefore the clinics of such men have a larger proportion of cases of this kind.
3. Some authors may include in their series cases of cholecystitis without calculi which, of course, would serve to reduce the proportion of cases in which stones are present in the common duct.

The total number of gall-bladder operations performed in the author's practice and in association with other colleagues is 620. Of this number, 512 showed the presence of calculi somewhere in the biliary passages, while in 108 instances the condition was cholecystitis without calculi. Stones were found in the common or hepatic duct in 50 cases, approximately 10 per cent of the total number of those in which calculi were found.

In 14 of the cases of stones in the common duct the patients had been operated upon previously. In 4 instances the presence of the stones in the duct was discovered at the time of the primary operation, but in view of the patient's serious condition it did not seem wise to perform a choledochotomy at that time. In 5 of the remaining 10 cases, stones in the common duct had not even been suspected, either from the patient's history or palpation of the duct.

However skillful a surgeon may be, he will fail to discover a certain number of common-duct stones because of the fact that the last or retroduodenal portion of the duct, particularly where it passes through the head of the pancreas, is at times difficult to palpate and, according to Robson, this is the part of the duct in which the greater number of the common-duct stones lie.

Exploration of the duct will reveal stones that otherwise would have been overlooked and therefore should be done (1) if the classical symptoms of stone in the common duct—chills, fever, and icterus—are present, (2) if the duct is enlarged and thick walled, (3) if many small calculi are present in the gall-bladder or cystic duct, or (4) if the gall-bladder is atrophied. While the routine opening of the common duct in all patients with gall-stones is not justifiable, a certain number of stones will be overlooked unless it is done.

The author reports 5 cases with a fatal termination. Hæmorrhage was the striking feature in all. The most rapidly fatal hæmorrhage occurs in patients who have an acute exacerbation superimposed on the chronic jaundice. Acute jaundice is not so potent a factor in producing a hæmorrhagic diathesis as chronic jaundice. Therefore, the appearance of jaundice in common-duct cases will hereafter be an important factor in the author's decision for immediate operation.

The article is summarized as follows:

1. A considerable number of patients suffering from cholelithiasis have stones in the common duct.
2. A certain number of cases of stones in the common duct do not present symptoms sufficiently suggestive to justify exploration of the duct, and in some of these cases palpation will fail to disclose their presence.
3. Even exploration of the duct may not reveal the presence of calculi though the previous and subsequent history of these patients may indicate or prove that they were actually present.
4. The mortality in common-duct cases operated upon is given variously at from 6 to 16 per cent. In the author's series, 5 patients died, a mortality of 10 per cent. In the cases in which there were no calculi the mortality was about 2 per cent. The obvious lesson is that in cholelithiasis operation should be performed early before the entrance or the formation of calculi in the common duct and that cholelithiasis is essentially a surgical problem.

E. A. PRINTY.

**Andrews, E. W.: Cholecystectomy and the Management of the Proximal Stump of the Cystic Duct.** *Surg. Clin. Chicago*, 1919, iii, 237.

Removal of the gall-bladder does not give immunity from recurrence of the trouble in the biliary system and an appendage is removed which would be useful if later drainage of the gall-tracts either externally or by a cholecystenterostomy is required. Moreover, secondary operations are often more easy to perform if the gall-bladder has not been removed. One form of recurrence after "ectomies" is the development of what appears to be a new gall-bladder, i. e., dilation of the proximal stump of the cystic duct. In performing a cholecystectomy, therefore, the entire length of the cystic duct should be removed.

According to the author's technique, the clamp is used only for the distal side of the cystic duct,



and with a fine aneurism needle a ligature is placed on the proximal side. This is tied firmly before the duct is divided. By making traction on the ligature, the remainder of the stump of the cystic duct is freed down to the wall of the common duct, and a second amputation is done very close to the outlet. In many instances it is better not to ligate but to cut it close and introduce a probe, split the common duct, and explore it in both directions. A T-shaped tube which will permit drainage of the choledochus during the after-treatment should then be introduced. The remaining steps are ligation of the cystic artery and subserous enucleation of the body and fundus of the gall-bladder with closure of the peritoneal flap so as to obliterate the raw surface next to the liver. In the case reported the abdominal wound was closed without drainage. In cholangitis and severe sepsis, however, it is best to drain, preferably through a stab wound just in front of the right kidney. E. A. PRINTY.

**Masson, J. C.: Exposure in Gall-Bladder Surgery.**  
*Ann. Surg.*, 1919, lxi, 422.

It is now generally agreed that there are few cases in which the patient's best interests are served by merely draining the gall-bladder, although it must be admitted that in the hands of the casual operator cholecystostomy is safer than cholecystectomy. There is still considerable argument, however, as to which method of removing the gall-bladder is to be preferred. The author maintains that with good exposure it is possible to excise all gall-bladders by beginning at the cystic duct.

According to the method of choice, an incision is first made extending from the midline at the tip of the ensiform cartilage to a point 2 inches to the right of the umbilicus. After the usual exploration of the abdomen, the stomach, omentum, and intestines are packed off with three or four abdominal sponges and held in place by the assistant's left hand. It is important that the assistant should not move this hand after the sponges are once arranged. In the exceptional case additional exposure may be obtained by inserting a pack (4 inches by 3 feet) between the posterior-superior surface of the liver and the diaphragm.

Owing to the frequency of anomalies of both ducts, it is absolutely necessary to know just what each forceps includes before it is clamped. In cases of large, tense gall-bladders it is often advisable to empty the gall-bladder with a trocar first and then apply a 6-inch curved forceps to the fundus and another to the ampulla where it overlies the common duct. By a little tension on the lower forceps, the cystic duct may be isolated throughout its entire length. Before cutting the cystic duct, the common duct should be palpated. If exploration is warranted, the author believes it is preferable to make an incision in the common duct rather than to attempt investigations through the open end of the cystic duct. While in the occasional case in which it is very difficult to expose the cystic duct and artery it may be necessary to begin the removal of the gall-bladder at the fundus, the author strongly maintains that this operation is very rarely indicated.

GATEWOOD.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES.

**Ferris, A. W.: Case of Osteitis Deformans.** *Med. Rec.*, 1919, xcv, 853.

The author first saw the patient, a woman 55 years of age, in January, 1913. At that time she was suffering from pain in various joints, had great difficulty in sitting and rising, and walked with a waddling gait. In 1907 she had "rheumatic pains" for the relief of which she went to Europe. She lost much weight due to drinking large quantities of vichy water, and on her return was in perfect health. In 1910 she began to have occasional pains in both knees and noticed that her legs were becoming bowed. During the winter of 1910-11 she was treated for "rheumatic gout" but did not improve. At this time it was noticed that her temples had become shrunken and her head somewhat triangular. Various treatments were instituted without relief. During 1912 she had pain in the wrists and elbows, and recently there had been nocturnal pain in the left hip.

Paget in 1877 reported the first case of the kind under the name "osteitis deformans." In 1901, Packard, Steele, and Kirkbride published a paper in which 100 cases were considered, but only 67 were regarded as true cases. Another instance was reported in 1912 by Jones, who stated that, as far as he was able to discover, only 26 cases had been reported in this country since 1901. Of the 68 cases, 42 occurred in males and 26 in females. The oldest patient was 73 and the youngest 39 years of age.

The oldest patient whose case is on record was a woman 92 years of age, while the youngest was a girl of 16.

The general health is usually unimpaired, even when the cranial bones are thickened. All patients complain of pain in the bones affected, usually of a rheumatic or neuralgic type. The larger bones are usually affected first, then the skull, and then the upper extremities. Probably involvement of the spine, which consists of forward flexion and shortening, comes next. The neck becomes fixed and the head inclines forward, sometimes being more or less dropped on the chest. The joints are rarely involved, although in consequence of the bowing



deformity of the legs, walking is often painful and difficult. Nothing is known of the etiology.

In regard to the pathology, von Recklinghausen advanced the theory that the disease starts out as a true osteomalacia associated with inflammatory processes which lead to the transmission of medullary substances into fibrous tissue over which new bone grows.

The earliest pains are probably due to a stretching of the periosteum caused by the deposit of inflammatory products and new bone beneath it. The later pains are probably due to distortion of the joints.

Examination of the author's case showed that the bones of the skull formed a much larger proportion of the cranium than they should as compared with the bones of the face. The curves of the clavicles were increased. The arms were too long for the body and were curved with an inward convexity. There was dorsal kyphosis, but no scoliosis. The pelvis was not noticeably enlarged. The glutei were prominent, though flabby, and showed atrophy. The trochanters were not higher than normal and the necks of the femora were not horizontal, a fact noted in a large proportion of the cases reported. Both femora were curved outward and forward, the left more so than the right. The left tibia was also more involved. The patient was 2 inches shorter than she was four years ago. Standing with heels together, the distance between the internal malleoli was 2.4 centimeters while between the internal condyles of the femora it was 18 centimeters. The outward bowing was most evident in the left femur and least evident in the upper ends of the tibiae. The femora appeared slightly enlarged on palpation. The heads of the tibiae were enlarged.

There was no tumor formation; external rotation and abduction of the femur was good on the right side, but restricted on the left. Flexion of either knee was somewhat difficult. The arm muscles were somewhat atrophied; the supra- and infraspinatus, noticeably. The knee jerk was diminished. There was no abnormal reflex. The skull measurements were as follows: Glabella to occipital protuberance, 37 centimeters; biparietal,  $16\frac{1}{2}$  centimeters; and circumference,  $56\frac{1}{2}$  centimeters. No definite line of treatment was followed. J. J. KURLANDER.

**Corner, E. M.: Infective Scar Tissue and its Relation to Pains, Particularly Painful Amputation Stumps.** *Lancet*, 1919, cxcvi, 840.

Beneath the sawed end of the divided bone is a dead space which becomes filled with scar tissue taking its character from that of the healing of the wound. When the wound heals well, the space is filled with non-infective scar tissue. In other cases the scar tissue is irritative and infective because of the microorganisms imprisoned in its meshes. Hence the local cause of painful nerves is to be found in a terminal infective neuritis rather than a "bulbosity." A bulbous nerve results from every division of a nerve trunk. If the ends of the nerve are inflamed the bulb is bigger and more tender.

When situated in infective scar tissue, silk and other unabsorbable material, such as iron, is slowly fragmented and removed. It is not isolated by encapsulation as in ordinary non-infective scar tissue. Therefore all foreign bodies should be removed and their tracks drained.

Among channels for disseminating the irritation of infection the vascular lymphatics come first as they carry the infection the greatest distance.

In the regeneration of nerves, a "regeneration neuroma" or multiple neuromata are formed, and if the newly formed regeneration fibers, tender and destitute of a medullary sheath, branch and grow into scar tissue which is still irritative and infective, pain is bound to result. If in the interval the scar tissue has been rendered non-irritative by the body chemicals, regeneration is not accompanied by pain. E. B. FREILICH.

**Wallace, J. O.: The Diagnosis of Syphilis of the Bones and Joints.** *J. Orthop. Surg.*, 1919, i, 258.

The diagnosis of syphilis of the bones and joints has been neglected. A complete history, particularly with regard to past illnesses which may have been luetic, is an essential.

The series of cases reported included only cases of joint involvement which were secondary to bone lues.

The onset is generally insidious and characterized by frequent relapses. Pain is a prominent feature of the clinical picture. Swelling is present in 50 per cent of the cases, while in 70 per cent there are points of tenderness. Fluctuation is present in 9 per cent. In swollen joints it is the bone and not the soft parts which is enlarged. This is a diagnostic sign.

Twenty-four of 38 cases gave a positive Wassermann test, 2 were doubtful, 8 were negative, 1 negative with a positive luetin test, and in 4 no Wassermann test was made.

In this condition roentgenograms show a periostitis or osteitis or both. Either may be general or local. In the former there are successive layers of subperiosteal calcareous deposits due to successive attacks of periostitis.

In the X-ray examination osteitis gives shadows which accentuate the normal cortical or spongy bone and are due to sclerosis. This sclerosis may be external, causing bowing, or internal, obliterating the medullary cavity.

Gummata may be multiple or single and show on X-ray examination a translucent center surrounded by a sclerotic wall with usually an area of periostitis over it.

The author summarizes the points in the differential diagnosis as follows:

#### DIFFERENTIATION FROM TUBERCULOSIS

In syphilis the process begins in the epiphyseal end of the diaphysis or in the shaft, while in tuberculosis it begins in the epiphyses.

There is marked periosteal thickening in syphilis, while there is little or none in tuberculosis.



In syphilis there is bone proliferation, in tuberculosis bone destruction.

In syphilis there is hypertrophy; in tuberculosis, atrophy.

In syphilis the swelling is due to thickening of bone while in tuberculosis it is caused by thickening of the soft parts.

In syphilis suppurating sinuses are rare while in tuberculosis they are not uncommon.

In syphilis multiple lesions are common, while in tuberculosis they are rare.

#### DIFFERENTIATION FROM CHRONIC PYOGENIC OSTEOMYELITIS

In syphilis, periostitis is marked, while in chronic pyogenic osteomyelitis it is not so marked and may be slight or absent.

Osteosclerosis and osteoporosis are more uniform in syphilis than in chronic pyogenic osteomyelitis.

An involucrum is present in chronic pyogenic osteomyelitis but not in syphilis.

Newly formed bone is thinner and more porous and the borders are thinner and more irregular in chronic pyogenic osteomyelitis than in syphilis.

In chronic pyogenic osteomyelitis there is extensive destruction or absence of bone cortex and a sequestrum large or small, while this is absent in syphilis.

Some cases are hard to differentiate.

#### DIFFERENTIATION FROM SARCOMA

Sarcoma affects the ends of the diaphysis by preference.

There is some disturbance in the minute structure of the bony tissue. It consists of absorption of lime salts. In certain areas there may be increased density. This disturbance is comparatively localized and spreads peripherally, the greatest destruction being at the point of origin. Associated are swelling and new growth. If the sarcoma is central, the walls of the bone seem to be bursting apart. In cases of peripheral sarcoma the surface of the bone is found to be rough and uneven and the density shades gradually into the soft tissues. In this peripheral variety the periosteum is often found lifted up highest over the greatest diameter of the tumor and then slopes gradually downward until it becomes a part of the bone again.

#### DIFFERENTIATION FROM CARCINOMA

In carcinoma there is never any tendency to bone hypertrophy, as would be expected from the pathology. It evolves not only in the bone substance but in the stroma as well. Therefore there is almost complete destruction of the bone. The bone substance remaining in the tumor is spongy, porous, and eroded.

#### DIFFERENTIATION FROM RACHITIS

In rachitis the epiphyses may be absent or cloudy in the roentgenograms while in syphilis they are clear and not seriously disturbed.

The changes at the epiphyseal end of the diaphysis appear in syphilis in the foetus or in the new-born, while in rachitis they occur at the time of the first dentition.

Cortical thickening in rachitis is endosteal and is always on the concave side of the curve, while in syphilis it is periosteal and is uniformly on the convex side of the curve.

The two conditions are often associated, making the differential diagnosis very difficult.

Twenty-six case records are given with comments and roentgenograms of the various luetic conditions and lesions to be considered in the differential diagnosis.

The article is summarized briefly by the author as follows:

1. From the relatively small number of cases in hospital records and in the literature, it would seem that syphilis of the bones and joints has been largely overlooked, particularly before the X-ray and Wassermann were in general use. At the present time, we exclude syphilis as a primary or complicating factor in all cases of bone and joint disease.

2. Syphilis is often present as a complicating factor or may be merely coincidental when the disease of the bone or joint under consideration has some other etiological factor such as tuberculosis, osteomyelitis, or rachitis. Therefore a history of syphilis, the presence of other manifestations of the disease, or a positive Wassermann does not prove that the bone or joint under consideration is syphilitic. It must not be forgotten that a positive Wassermann or a positive von Pirquet is not *prima facie* evidence that the disease exists alone, and that syphilis is an excellent medium for the implantation of tuberculosis or any other infection.

3. A history of syphilis or the presence of other manifestations of the disease is of value in suggesting its presence, but not of any absolute diagnostic value, as it does not exclude the presence of tuberculosis or other bone and joint diseases.

4. In studying symptoms and physical signs alone it has been impossible to differentiate those due to syphilis of the joints from those due to other etiological factors.

5. The Wassermann reaction is very valuable, but only as one point in the diagnosis. Although in many of the cases reported the Wassermann reaction was negative, the condition was undoubtedly syphilis, as shown by the X-ray and the response to antisyphilitic treatment. Cases have been observed also in which the Wassermann was positive although the condition in the bones and joints proved to be some other disease. In some of the cases syphilis was undoubtedly a complicating factor because improvement was not marked until antisyphilitic treatment was instituted. A routine Wassermann is taken in all our cases of bone and joint disease, and in those which are negative but in which the clinical symptoms or roentgenograms suggest syphilis, a provocative Wassermann has been found in some instances.



6. The luetin test has also been found to be of value as it is sometimes positive when the Wassermann reaction is negative.

7. The finding of a negative von Pirquet is of value in doubtful cases.

8. The roentgenogram is the most valuable factor in the diagnosis of syphilis of bones and joints and in differentiating it from other conditions. In one case there was a history of a primary infection and the Wassermann was positive. The roentgenogram, however, showed nothing suggestive of syphilis but indicated the presence of tuberculosis. On section of the bone and pathological examination the condition was reported to be tuberculosis. In the cases reported syphilitic arthritis was not found without bone involvement. The roentgenogram of the joint involved may indicate nothing, while a roentgenogram of other bones or those contiguous to the joint may show a typical syphilitic osteoperiostitis. In one case in which complaint was made of discomfort in the knee, a roentgenogram showed typical syphilitic involvement of the radius and ulna. In studying the roentgenograms it has been impossible to discern any difference between cases in which the condition was acquired and those in which it was congenital, with the possible exception of congenital syphilitic osteochondritis.

9. The so-called therapeutic test is also of some value in the diagnosis of obscure bone and joint lesions when an absolute diagnosis cannot be made from the clinical and laboratory findings.

In 38 cases of bone and joint syphilis, the condition was congenital in 22 and acquired in 16. In 34 cases in which an X-ray examination was made, only 8 patients had an involvement of one bone alone, and 16 an involvement of the joints as well as the bones.

K. L. VEHE.

**O'Reilly, A.: Subdeltoid Bursitis and Stiff and Painful Shoulder.** *J. Missouri M. Ass.*, 1919, xvi, 149.

In subdeltoid bursitis the structures which play the most important part are the bursa and the tendon of the supra-spinatus muscle. Any force which drives the head of the humerus upward may injure the bursa or the tendon or both, causing an inflammatory reaction in the former. Bursitis may result also from infection.

There are three types of bursitis: (1) acute or spasmodic, (2) subacute or adherent, and (3) chronic or non-adherent. In the first type the pain may be severe, located on the point of the shoulder just below the acromium, and referred to the deltoid insertion or the elbow and fingers. In Types 1 and 3 with free motion the Dawborn sign is elicited by abducting the arm. The point of tenderness which is just below the acromial tip disappears as the bursa passes beneath that process and reappears on adduction.

Patients with subdeltoid bursitis cannot put their hands to the small of the back or the back of the neck. Motion may be limited in the shoulder

but about 10 per cent persists even when the condition is severe, while in true joint involvement this last fraction is obliterated.

Codman described a test according to which the patient who is unable to raise his arm is told to bend forward and touch his toes. In so doing he is aided by gravity and as he straightens the surgeon raises and holds the arm up. The arm is then vertical without pain, but on lowering it the pain recurs.

Acute cases are treated with rest, salicylates, and iodides. The patient is put to bed with the arm in abduction held by a sling attached to the head of the bed. Later and in other types, radiant heat, passive motion, massage, and resistive motions are used. Occasionally the adhesions should be broken up with the patient under the influence of an anæsthetic. Very rarely it is necessary to open the bursa and break and cut the adhesions. The former was done in 4 instances, the latter not at all, in the writer's series of about 75 cases.

K. L. VEHE.

**Lowman, C. L.: Rotation Deformities.** *Boston M. & S. J.*, 1919, clxxx, 581.

In correcting weak, pronated feet the author directs his attention to two chief factors: (1) the control of the whole leg lever, and (2) the correction of the torsion deformity of the foot. In some of his cases, although the feet were quite flexible, the patients could not be made to use them in proper relation to their legs. When the knees were flexed in the normal plane, the feet were averted and toed out.

When such feet were held in varus by using Thomas heels, the muscle strain was relieved but the anteroposterior axis of the feet did not coincide with that of the knee and a certain amount of out-toeing remained which could not be corrected. When by determination on the part of the patient, the feet were used in the straight position, the inward rotation of the thigh still persisted. The knee action was then in a plane inside the anteroposterior axis of the foot and the inward rotation in the hip joint was in direct relation to the foot position.

The author's efforts to control the high rotation consist first in correcting or lessening the degree of rotation by raising the inner border of the foot and throwing the heel in varus, and second, in removing the twist from the forefoot. This is accomplished in flexible feet by adducting the forefoot or checking its abduction by lowering the foot plate under the cuneiform and first metatarsal. The lacing of the shoe then exerts a downward and backward thrust while the fulcrum under the scaphoid and front of the os calcis controls the tendency to lower and pronate at those points. The reverse twist is aided by thickening the sole of the shoe under the fifth metatarsal shaft and head. The common practice of raising the inner border of both sole and heel tends to throw the entire foot into varus and prevent the torsion of the forefoot. After tension



on the rotary apparatus is lessened, all the muscles and ligaments that prevent inward rotation are strengthened and toned up.

The muscles are the piriformis, gemellus, obturator, and gluteal groups. In many foot cases operated upon relapse occurs because the rotation deformity received no consideration. Severe rotation deformities are seen in paralysis, club-foot, and congenital hip conditions. In a number of cases presenting a more or less severe degree of rotation of the shaft of the femur or tibia, osteotomies are frequently performed with excellent functional results.

J. J. KURLANDER.

## FRACTURES AND DISLOCATIONS

**Dehelly, G., and Loewy, G.: Effacement of Cavities in the Treatment of Fracture.** *Ann. Surg.*, 1919, lxix, 367.

A dead space between the tissues plays a very important part in infection. A free space between two layers of tissue becomes filled with blood or serum. If the wound remains sterile this hæmatoma becomes encysted and is progressively reabsorbed, but if a sufficient number of virulent bacteria have contaminated the cavity, suppuration transforms it into an abscess.

These facts have not been sufficiently emphasized in the treatment of fractures. Cavities have been drained, but not enough attention has been paid in cases of infected fractures to effacing the cavities formed by the displacement of the fragments. The authors believe that bridged plaster casts and immobilization by means of traction and suspension such as that obtained by the Thomas and Blake splints, have a great drawback in that they do not permit the compression of the focus of the fracture.

Whenever possible after the sterilization of a fracture of the femur, the authors have used the Hennequin apparatus and believe that they have obtained much better results. This apparatus consists of a wire frame well padded with surgical cotton and arranged with two straps so that it can be made to apply snugly to the wounded member and exert an even pressure upon it throughout its extent.

In operating upon the different types of cavities the authors have endeavored to follow the general rules of surgical technique: (1) the operation itself must not create a cavity in or near the bone; (2) the overlapping fragments must not be cut perpendicularly to the axis of the bone for this leaves a triangularly shaped dead space; (3) when it is necessary to gutter a long bone, three sides rather than one must be removed so that the soft parts will fall in and obliterate the dead space.

The authors cite a number of cases as examples of their method of handling infected fractures. In amputations of the leg they advise the removal of the fibula as it is not necessary for the solidity of the stump.

GATEWOOD.

**Fresson, H., and Toupet, R.: The Treatment of Supracondylar Fractures by Steinmann's Nail-Fixation Method** (Traitement des fractures sus-condyliennes par la broche de Steinmann). *Rev. de chir.*, Par., 1918, lvi, 161.

Of all war fractures general experience has shown that supracondylar fractures are the most formidable because of both their immediate and their end-results. Up to the end of 1917, before using the Steinmann nail or pin fixation, the authors had treated 117 of such fractures according to all other known methods. In this series of cases there were 7 deaths in cases in which amputation was not performed, 11 deaths after amputation, and 42 failures. These results do not differ appreciably from those obtained in other surgical centers.

In a series of supracondylar fractures treated by Steinmann's method during 1918 the mortality was only 6.1 per cent and there were no amputations. The deaths were those of patients with multiple wounds and occurred within the first forty-eight hours after the injury. The difference in the prognosis of such fractures is very marked when a method is employed which reduces the backward displacement of the inferior fragments and hence obviates the immediate or late complications. The danger consists especially in the basculation of the inferior fragment; apart from ulceration it may traumatize the tissues, set up ischaemia, and render them incapable of resistance against gangrene. The area cannot be correctly dressed, and in spite of the most minute surgical clearance and Carrel-Dakin irrigation there is often marked suppuration, the knee becomes infected, and an amputation is required.

The authors review the various methods that have been employed in treating supracondylar fractures and show that with all, except Steinmann's nail-fixation method, an insufficient or an incorrect reduction of the fragments is obtained.

The nail-fixation method was originated by Codavilla in 1903 for a particular case, but it was Steinmann of Berne who generalized it and applied it to all irreducible fractures. His "Nagelexension" method was executed with two nails or pins embedded for some centimeters in the femoral epiphysis and planted obliquely. The fear of the spread of infection from the area of fracture to the epiphysis has deterred most surgeons from using the method, and, in France at least, it was rarely employed before or during the war. The few who did use it, however, reported good results.

The nail-fixation method fulfils two functions: (1) it reduces the over-riding; and (2) it reduces the backward basculation of the inferior fragment.

A number of schematic drawings are given with explanations showing how these effects are produced. Traction is exerted in proportion to the amount of over-riding.

The single pin or nail used by the authors is made of very rigid steel wire 3 millimeters in diameter and 15, 16, or 17 centimeters long; it is left quite plain without nickeling or other finish.



The metallic tractor is shaped like a horseshoe. In one extremity is a hole through which the pin passes on exit from the limb and in the other a hook by which the other end of the pin is held. The nickel strip of which it is composed is 25 millimeters wide and 2 millimeters thick. The point where the pin should be inserted is discovered by palpation and the pin is placed in position with the aid of local anæsthesia. The exact technique to be followed is described in detail and illustrated.

Of the 32 supracondylar fractures treated, 6 were closed fractures. As stated, there were two deaths, these two cases being really beyond the resources of surgery. Eighteen of these patients left the hospital with their fractures perfectly consolidated and able to walk; in 14 instances the fractures were consolidated and the pins removed but the patients were evacuated in a plaster cast for military reasons. In one case the fracture was reduced but had not yet consolidated. Shortening was always negligible.

The authors conclude from their experience that the best method of treating supracondylar fractures is by traction exerted through a nail-fixation apparatus. This method is also the best whenever it is necessary to exert traction on a flexed knee or when energetic traction must be used.

Several case histories with radiographs are given.

W. A. BRENNAN.

**Stoner, A. P.: Fractures Complicating the Ankle-Joint.** *J. Iowa M. Soc.*, 1919, ix, 148.

The author gives a detailed description of the ankle. Formerly, before the use of the X-ray, many cases of fracture about the ankle-joint were diagnosed as sprains.

Fractures of the ankle-joint are most frequently the result of a fall or of jumping from a height, and the type of fracture depends upon the position of the foot at the time of injury. In setting the fracture the foot should be placed in the opposite posture from that in which it was when the fracture occurred.

Points about Pott's fracture to bear in mind are:

1. Pott's fracture is always an eversion and abduction fracture.
2. The fibula is always fractured and usually within  $1\frac{1}{2}$  inches of the point.
3. The tibiofibular and interosseous ligaments are always ruptured, permitting more or less separation of the lower fragment of the fibula from the tibia.
4. For proper healing in Pott's fracture the foot should be placed in the most exaggerated adducted and inverted position and maintained in this posture until healing is complete.
5. An inversion fracture is never a Pott's fracture and should be put up in the reverse position, abduction and eversion.
6. The joint should not be exercised until after a period of eight weeks, and no weight should be borne on the foot for three or four weeks longer.

I. E. BISHKOW.

## SURGERY OF THE BONES, JOINTS, ETC.

**Cotton, F. J.: The Lengthening of Stumps.** *Mil. Surgeon*, 1919, xlv, 465.

This article describes a transplanted-flap operation for stumps which conserves their length and may be substituted for the old and common method of re-amputation of stumps which need repair. It is the method used in plastic surgery to secure flaps of skin from distant parts of the body—"whole thickness" flaps, including skin, fat, subcutaneous tissue, and even fascia—for covering denuded areas. A case of remodeling of a thumb stump in this way is described.

Instead of sacrificing bone which ought not be lost, soft tissue which can easily be spared is transplanted by a two-stage operation, a method familiar in industrial surgery and very greatly developed during the war.

Emphasis is placed upon the necessity for exact apposition of the edge of the graft to the edge of the wound as upon this it seems depends the nutrition of the flap rather than upon the contact of the bottom of the flap which, as a source of blood supply, is of only secondary importance. To such accurate apposition the author attributes his present 100 per cent of "takes." Another requisite of success is good hæmostasis, neglect of which results in the formation of a hæmatoma beneath the flap. The latter is prevented by crushing the vessel mouths with forceps rather than ligating or suturing. The nature of the ground for the transplant does not seem to be very important except that fresh wounds are not favorable. Quite bare bone or tendon affords good ground as does other dense fibrous tissue. Scar tissue should always be removed freely.

Asepsis is less important. Provided there are no pockets of infection, ordinary disinfection and cleaning with alcohol prevent sepsis. The place from which the graft is taken is determined by its proximity to the part to be covered. Transplanting the flap to an intermediate area and from there, after separation from its base, to the final site, is a resource possible in extraordinary cases. For the size of the flap one rule is important: make it big enough. It will contract about one-third in each direction. The direction of the pedicle is not of great importance. At the second operation it may be necessary to cut the pedicle in two steps to avoid too sudden change in a redundant circulation. The flap is fastened into position with interrupted sutures of linen or silk. The wound from which the graft came is closed by primary suture. Closure of the wound left when the flap is cut loose depends upon circumstances. As the surfaces are not strictly aseptic, secondary suture is appropriate. Dilute alcohol is a good dressing material. The usual time to obtain a "take" is from ten to fourteen days. Cutting the flap loose may be done under local anæsthesia. Usually it is better to fit it into place with the patient under ether. Flap sloughs do not occur and small skin sloughs may be avoided



by not undermining the edge. The flap should be fastened in its prepared bed with its perpendicular edges nicely held with interrupted sutures.

F. W. PINNEO.

**Gallie, W. E., Dunn, N., and Smith, A.: Discussion on Bone Grafting.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Surg., 22.

In this discussion Gallie stated that ten days after the implantation of a bone-graft the proliferation of the osteoblasts on both the endosteal and periosteal surfaces is established and excavations are produced in the graft. New blood-vessels are seen in the mouths of the haversian canals, and gradually the osteoblasts and blood-vessels permeate the whole transplant. When boiled bone is employed these changes take place at a definitely slower rate. Autogenous grafts alone guarantee success when there is a gap to be bridged. As living osteoblasts survive only on the surface of the graft, its width should be greater than its thickness. A rib-graft is better than a tibial graft as it is more porous and better supplied with lymph, but it is not so strong as a tibial graft and therefore the latter should be used when strength is required.

According to Dunn, there are two questions which should be answered before resorting to bone grafting: (1) will re-establishment of continuity improve function, and (2) is the use of the bone-graft the best means? When in ununited fractures of the forearm there is ankylosis of the superior or inferior radio-ulnar joints, any movement of pronation and supination at the site of the fracture would be lost if union of the fragments were established. The hand articulates mainly with the radius, and in practically all cases of ununited fracture of the lower two-thirds of the radius a bone-graft will be necessary to give stability to the hand. When the lower fragment of the radius is less than 1 inch in length, shortening of the ulna to correct the radial deviation and allow direct union of the radius gives the best results. Ununited fracture of the lower one-third of the ulna or of the olecranon may, as a rule, be ignored. Often in fracture of the femur the mere freshening of the ends with efficient external fixation gives excellent results. Moderate shortening of the humerus is not a serious disability, and direct apposition of the ends with shortening is to be preferred. When the entire upper fragment is lost, direct fixation to the scapula will give better functional results than the use of a graft.

Success in bone grafting is dependent upon: (1) asepsis, (2) adequate contact of raw surfaces, and (3) efficient fixation. After severe sepsis the wound should be entirely healed for six months. A preliminary excision of scar tissue should then be done which enables the operator to determine the presence of sepsis, removes tissue of low vitality, and allows healthy vascular tissue to surround the graft. The graft should consist of periosteum, cortex, and endosteum and should be

strong enough to withstand the strain of function when its union to the fragments is complete. The joints above and below the fracture should be controlled, but movement of the digits encouraged. The graft should fit tightly in the bed prepared for it, and should be held firmly in place with kangaroo tendon. After hæmostasis is complete, the wound is closed with both superficial and deep sutures with drainage tubes of rubber which are left in place for forty-eight hours.

In 75 cases, fracture of the tibia from which the graft was removed occurred in 2, in one instance six weeks after the operation, and in the other, two months later. As a rule, an X-ray taken three months after the removal of a graft will show no loss of density of the bone.

Smith stated that it is to be expected that more consistent results are to be had in the young than in the middle-aged and in the simple ununited than in compound fractures which call for the bone-graft. Operation should not be performed in any septic case unless:

1. The discharging wounds have been healed for from nine to twelve months. During this period treatment should consist of immobilization, massage, passive congestion, and percussion by means of a wooden hammer on the region of the fracture.

2. A preliminary operation for the removal of the scar has been performed. In cases which have been healed for months small sequestra and encapsulated abscesses have been found.

3. A course of provocative massage of a month's duration has been instituted and has not been followed by a flare-up.

4. The wound can be covered with healthy skin without tension. In such cases pedunculated skin flaps may be implanted as a preliminary operation.

From the operative standpoint the following points are of importance: (1) perfect asepsis, (2) perfect hæmostasis, (3) close coaptation between the host and graft, (4) rigid fixation of the graft to the bone, and (5) rigid immobilization of the limb for at least twice as long as in ordinary fracture, though massage and active movement of the muscles may be begun early.

P. W. SWEET.

**Osgood, R. B.: Gunshot Injuries to the Joints.** *J. Orthop. Surg.*, 1919, i, 304.

The essentials in the treatment of gunshot injuries of joints seem to be the following, given in the order of their importance.

1. Fixation and traction provided at the earliest possible moment by thoroughly efficient splints and continued in transport till a hospital is reached at which the patient may remain until convalescence from a possible operation is sufficiently well advanced to allow safe further transport (in all probability two or three weeks).

2. Early careful examination, radiographic, bacteriological, and clinical, at the earliest possible moment after the injury. This examination must



be carried out by a specially trained surgeon capable of operating skillfully and at once, and at a well-equipped hospital, not far from the line, where the patient may remain under the close observation of this surgeon or his qualified assistants until convalescence is well established.

3. Primary, delayed primary, or secondary closure of the wound in all operative cases by a special technique now sufficiently well established to be regularly followed, and which in the secondary closures involves a thorough knowledge of the Carrel-Dakin method.

4. After-treatment to assure most perfect function, consisting of early active motion. Later massage, possibly electrical and hydrotherapeutic treatment, often in conjunction with special orthopedic apparatus, and curative occupational therapy.

V. C. DAVID.

**Everidge, J.: A New Method of Treatment for Suppurative Arthritis of the Knee-Joint.** *Brit. J. Surg.*, 1919, vi, 566.

Current methods of treatment, such as various types of drainage and chemical methods with prolonged immobilization in the suppurative cases, have marked disadvantages the chief of which is that during prolonged rest the limb suffers muscular atrophy and is largely deprived of its blood supply. This is partly due to the lack of muscular action to promote the flow of blood in the veins. Tracking sepsis may occur when the main artery has been ligated. These facts are sufficient to warrant reconsideration of the advisability of complete rest in suppurative arthritis of the knee.

The author has endeavored to evolve a method of treatment which aids the natural powers of resisting infection to the utmost. This method, which he calls the "physiological method," relies upon active movements of the joints of the lower extremity including the knee, combined with adequate openings into the infected joint to allow the free escape of synovia and pus which otherwise would be disseminated by the movements. Active movements are begun soon after operation. The patients coöperate better when shown that, coincident with the visible escape of pus from the joint, the movements alleviate the pain.

The method described has five advantages which may be summarized as follows: (1) it hastens repair by preserving a good blood supply to the tissues of the joint; (2) aids drainage; (3) prevents extreme atrophy of the muscles so that they may better resume function; (4) establishes a process of auto-vaccination; and (5) realizes the possibilities of a subsequently mobile joint. Experience has shown, however, that this treatment is not advisable in cases of gross injury to the articular bone, essential tendons, or ligaments, or when suppuration has gone on for sixteen days or more.

Bacterial invasion of the joint cannot be determined early by examining the fluid, although usually evidence of soiling may be obtained. Cultures are

positive and give evidence either of a clearing up of the infection when the toilet operation is successful or a multiplication of organisms up to about the sixth day when symptoms of infection arise. A preponderance of leucocytes is not pathognomonic of severe septic infection, but 80 per cent of polymorphs in a differential count marks roughly the dividing line between a good and bad prognosis. Extracellular organisms and the absence of phagocytosis when suppuration has lasted for ten days point to a severe infection and limitation of the power of resistance.

During the developing stage there is first a discolored synovial fluid, due to altered blood, followed by albuminous fluid like coagulating white of egg, and then a seropurulent fluid. Established suppuration shows pus which in staphylococcal infection is thick and creamy and in streptococcal infection thinner and less viscid.

During subsidence there may be pus with semi-solid curd, curds floating in a clearer fluid, and last, synovia, clear and limpid. In the last stages, partial or complete secondary suture may be done unless there is necrosis of the bone.

The only three tissues present in the joint to react are the synovial membrane, the synovial fluid, and the cartilage. The author concludes that the synovial fluid must be the most valuable germicidal agent. Its action depends, he believes, upon the blood supply and its flushing action. The flushing action and avoidance of stagnation are of great importance in the natural recovery. Thus the removal of stagnating synovial fluid may be the potent factor in the treatment by paracentesis followed by the injection of an antiseptic fluid referred to by Lockwood.

In penetrating injuries of the joint, the percentages of soiling are given usually as between 70 and 80 per cent. When a foreign body is lodged in the joint, organisms have been introduced. However, after removal of the foreign body and a joint toilet, treatment has failed in only about 20 to 30 per cent of the cases.

The details of the physiological method are as follows: A parapatellar incision is avoided because it causes wide gaping of the skin and slow healing; the joint openings tend to close early as the split muscle and tendon fibers fall together; it interferes with the blood supply which goes transversely to the joint; hæmorrhages may occur; and in case of amputation the anterior flap is interfered with. The author, therefore, uses transverse incisions at the inner and outer borders of the patella, beginning at the juncture of the upper and middle thirds of the bone and continuing backward for about  $1\frac{1}{2}$  inches. The lateral ligaments lie below and behind this incision. The cut edges of the synovial membrane are then stitched to the skin, a single layer of rubber tissue being inserted between the lips and left in place for twenty-four hours. When the edges do not retract sufficiently, an elliptical segment is excised.



To aid these patients in moving their knees an apparatus is used. Gravity is eliminated by means of a hinged rolling splint suspended by carefully controlled weights attached through pulleys.

The physiological method must be instituted early at the first signs of sepsis. The author believes it unwise to resort to arthrotomy, lavage, and closure when sepsis occurs as late as a week after the original wound or primary operation. At this time this treatment would be useless and would simply increase the dangers and decrease the chances of obtaining a good result.

If in the virulent types of inflammation the movements become restricted and painful toward the end of the third week, it may be due to a collection of pus in the popliteal space or an erosion of the articular cartilages. If the latter has occurred, a Thomas splint should be applied and the hope of obtaining a mobile knee given up.

A useful mobile joint resulted in about 50 per cent of the cases treated. The method is impracticable if its adoption is delayed until the fulminating stage of suppurative arthritis. G. L. McWHORTER.

### ORTHOPEDICS IN GENERAL

**Sherwood, W. A., and Jones, M. L.: Back Pain in the Military Service.** *J. Am. M. Ass.*, 1919, lxxii, 1599.

The authors give a classification of the causes of back pains as observed in military service, basing their study on 139 cases. They emphasize that in most cases thoroughness and group coöperation are needed to arrive at correct conclusions.

In a surprisingly large number of instances, the X-ray has revealed slight rotations and dislocations as causes of back pains.

Sacro-iliac pathology may be divided into infections and conditions due to mechanical causes. Dislocations or slips are relatively common. In such cases the patient gives a history of recurrent attacks of pain in the back after lifting, usually while stooping. There is spasm of the lumbar muscles and often a tilting of the pelvis to the affected side. Flexion of the thigh on the abdomen causes pain. Rectal examination reveals tenderness over the joint, but pain on compression of the pelvis is rare. A striking sign is tenderness over the symphysis, and a chief roentgen finding is misalignment of the symphysis. The authors' treatment consists of rest, adhesive strapping of special design, and belts. Manipulations have not been successful.

Tuberculosis was fairly common in both old healed and acute cases. K. L. VEHE.

**Marshall, H.: Case of Back Strain Causing Acute Retention of Urine; with a Brief Discussion of Various Phases in the Diagnosis and Treatment of Lesions of the Lower Region of the Spine.** *Boston M. & S. J.*, 1919, clxxx, 545.

Back strain may be due to strain of the sacro-sciatic ligament which can be felt by palpating with

the fingers deeply through the skin and overlying muscles; the posterior sacro-iliac ligaments, the deeply located ligaments at the lumbosacral juncture and higher up, and the very important common spinal ligaments which run along the anterior side of the vertebral body. Stretched ligaments may recover their strength to the extent that they are able to take care of increased strain without trouble, although they never regain their previous tone and shortness.

Soreness in the back is often attributed also to strain of the muscles, especially at their place of origin or insertion. Less frequently the cause is myositis.

Slipping sensations of the back frequently are interpreted as very slight slippings of the sacro-iliac joints, but in spite of many explanations are not anatomically established.

At times pain is referred to the lumbosacral or gluteal region, and may be felt down the posterior and outer edges of the thighs, even to the calves of the legs. Usually through the legs and hips it is unilateral. This is a reflex sensation of visceral origin caused by disturbance of the pelvic organs.

The explanation that neuralgic pain is due to direct stretching of the nerve of the plexus holds good only in exceptional cases. More often the cause is mechanical pressure as when inflammation and swelling of the iliopsoas muscle presses upon the lumbar plexus. The sympathetic nerve and sympathetic ganglionated cord in the lumbar and sacral regions of the spine also may be involved. At the lumbosacral juncture the sympathetic nerves run in front of the vertebral bodies and are exposed to unusual stretching.

In hypertrophic arthritis of the spine numerous instances of involvement of the ligaments on the anterior side of the lumbar vertebrae in degenerative processes of calcification are observed.

Partly degenerated fibrous attachments are apt to rupture and produce oedematous swelling.

Attention was first called to the relation of the vertebral anomalies and symptoms of the back by Goldthwait, who suggested the possibility of contact between the long transverse process of the fifth lumbar vertebra with the iliac bone in cases of sagging back. Occasionally this condition has been observed in anatomical specimens.

In interpreting X-ray pictures it must be remembered that apparent overlapping does not always mean impingement; as stereoscopic pictures often show that in such cases there is no actual contact.

Many persons have vertebral anomalies without any pathologic symptoms. At times, however, variations in the curves of the spine may have some direct bearing on serious back complaints. Extreme lumbar curves show that the spine has sagged.

Sacro-iliac displacements occur in demonstrable degrees only in most exceptional cases. Slight slipping can be neither proved nor disproved.

The writer reports one case in which there were bladder symptoms following back sprain on the



anterior side of the spine. These were due to pressure upon the nerves running to the bladder.

The author does not go into the details of treatment of these various conditions other than to mention the general methods now in use, such as strappings, exercise, jackets, and general hygienic measures.

ARTHUR STEINDLER.

**Hurst, A. F.: War Contractures—Localized Tetanus, Reflex Disorder, or Tetanus.** *Brit. J. Surg.*, 1919, vi, 579.

In the early stages the diagnosis between localized tetanus and hysterical spasm may be extremely difficult. If the contractures persist without abating for more than three or four weeks and do not disappear completely at the end of six or eight weeks, they are probably hysterical, even if at first they were due to tetanus. Spasms which begin immediately after the wound is inflicted cannot be due to tetanus; generally they are reflex and protective in nature, but are often maintained after the first few hours or days by autosuggestion.

A later onset is compatible with tetanus as well as hysteria and in both the extent of the contractures is often out of all proportion to the size of the wound. If the contracture persists in sleep, hysteria can be excluded. A general anæsthetic causes hysterical contractures to disappear more rapidly than tetanic contractures which persist to some extent even under deep anæsthesia. Hysterical contractures, however, may also continue after consciousness is lost.

If the muscles are of a wooden and unvarying hardness, tetanus is almost certainly present. An increase in the size of the muscle, possibly due to obstruction of its lymphatic vessels, without tenderness or subcutaneous œdema, is conclusive evidence in favor of local tetanus. The continued tonic contraction in tetanus is generally accompanied by spasmodic and more or less painful contractions which are often brought on by external stimuli.

Froment and Babinski believe that many of the contractures which have hitherto been regarded as hysterical or due to some obscure condition such as an ascending neuritis, as held by Tinel, are really reflex in origin. While this theory at first seems to offer a satisfactory explanation of many cases the nature of which is obscure, Hurst does not agree with it.

There is no doubt that reflex contraction of the neighboring muscles is not uncommon immediately after a wound is inflicted, the reflex being protective in nature. When the symptom persists after the wound is healed, it is no longer due to reflex action, but is the result of suggestion. The contracture is thus primarily reflex and subsequently hysterical. If a hysterical condition is not diagnosed, the patient will receive treatment for a long time for localized tetanus or reflex symptoms and will lose the value of psychotherapy.

The posture in hysterical contractures is identical with that which existed at the time the contractures

developed, and in many cases is that which was assumed immediately after the injury. Thus, if one or more peripheral nerves were damaged, the position corresponds with the position which would result from paralysis or occasionally from irritation of these nerves.

In such cases, when the nerve recovers from the effect of the injury, whether within a few hours, a few weeks, or months, the abnormal posture and the inability to move are maintained as a result of suggestion. In other cases the injury may lead to reflex spasm of the neighboring muscles and inhibition of movement of the whole limb which is protective in nature and rapidly disappears as the condition of the wound improves.

The patient more or less subconsciously assumes the position which gives most relief from the pain. He does not realize that the absence of voluntary effort on his part was to save him from pain, but believes that it was due to paralysis as the direct result of his injury.

Histories are presented illustrating all points discussed by the author, as well as the positions of the joints assumed in hysteria.

In many cases of hysteria the posture is that in which the surgeon fixed the limb by means of splints or bandages when it was first dressed. The patient becomes so accustomed to the immobility of the joint that when the splint or bandage is removed, he fails to realize that there is nothing to prevent the return of the normal functional activity. He makes a feeble effort to bend the joint, finds that it produces pain without any resulting movement, and gives up the attempt in despair, reconciling himself to the notion that the joint has become fixed as a result of the operation and that no voluntary effort will have any effect upon it. A little manipulation, accompanied by a few words of explanation, would at this stage dispel the erroneous idea in five minutes and the patient would be spared months of disability.

The development of hysterical contracture and associated paralysis is due to the fact that the patient fails to realize that there is no reason why the spasm should not relax and the power of movement return when the primary factor, nerve injury, protective reflex, conscious or subconscious antalgic spasm and inhibition of movement, localized tetanus, or fixation by splints, is no longer operative.

The patient regards the contracture and inability to move as direct results of his injury, and ignores the intermediate cause, the pain or tetanus. If it had been pointed out to him, when the pain was disappearing, that his incapacity was due to the pain and only indirectly to the injury, and that there was therefore no longer any reason why the incapacity should be maintained, he would have made the necessary effort and the hysterical condition would never have developed. Hysterical contractures and paralysis may result from injuries to the soft parts of the limb, with or without involvement of the bones and joints. Contractures



and paralysis of the same nature have been observed in fractures, dislocations, sprains, and contusions, when actual wounds were absent.

The normal circulation through a limb depends upon its active movements, the afferent nerve fibers from the muscles probably giving rise to localized reflex vasodilatation. If for any reason the arm is not moved in cold weather, the hand becomes shriveled, white or blue, numb, painful, and stiff. These well-recognized changes disappear at once with active exercise and warming of the limb, both of which restore the circulation. The tendency to disturbances of this kind is much greater in persons with poor circulation than in those with naturally good circulation. The immobility caused by paralysis or contracture of a limb, whether organic or hysterical, results in deficient circulation and the same secondary changes.

When the venous and lymphatic stasis is very marked, and the paralysis absolutely complete, œdema may occur, especially if the paralysis is accompanied by contracture in a position in which the veins and lymphatics are obstructed by the rigid muscles. The deficient circulation results in changes in the physiological properties of the paralyzed muscles, even if the paralysis is entirely hysterical. When the hysterical contractions are cured, circulation improves and the parts gradually return to the normal.

In breaking up hysterical joints the soft parts of the normal joint are often torn instead of the adhesions and effusion results. Hysterical contractures disappear only after deep anæsthesia. Violent movements with incomplete anæsthesia may thus result in the tearing of contracted but otherwise normal muscle fibers and normal fibrous tissue.

Anæsthesia due to cold if often repeated may become hysterical in nature by autosuggestion. This anæsthesia may be so complete that trophic ulcers may follow.

In hysterical contractures the X-rays show abnormal transparency of the bones, which apparently is due partly to deficient calcification and partly to absorption of the bony tissue. No definite alteration in the outline of the bones, however, has been observed. Although the joints occasionally appear to be enlarged, the X-rays show no change in the articular surface. This is consistent with the fact that hysterical disorders of joints never give rise to anatomical change as the result of pressure exerted on abnormal surfaces, however long the condition may persist. The enlargement of the joint may be due partly to œdema from deficient circulation, but is more often simply apparent and due to atrophy of the soft parts around the shafts of the bones. The nails become thin, brittle, and abnormally opaque, and in many cases show longitudinal grooves.

The excessive sweating which often occurs in these cases is more difficult to explain. It may be in part a direct result of the cutaneous asphyxia when the circulation is unusually feeble. In cases

of contracture in which the hand is tightly flexed, it is due in part to the fact that the air in contact with the palm is kept warmer than that in contact with the palm of the normal hand and evaporation which occurs in the enclosed space formed by the clenched hand is diminished. It is possible that the intense nerve impulses sent down from the brain to the centers in the spinal cord spread from the motor nerve-cells to the neighboring sympathetic nerve-cells which control the secretion of sweat. This would explain the fact that the sweating may occur also, though to a less extent, in the normal hand.

When hysterical paralysis, with or without contracture, has persisted for some months and psychotherapy leads to rapid recovery, it is often observed that although the patient is able to perform every movement in a perfectly normal way at the end of perhaps an hour, he tends to maintain the abnormal posture due to the paralysis and contracture as soon as his attention is withdrawn from the affected limb. Another striking fact in these conditions is the maintenance of the abnormal posture of the arm or leg during sleep. Hysterical contractures disappear during sleep, but in spite of this the abnormal posture is maintained, so that it is only by manipulating the limb that the absence of the spasm of the affected muscles can be demonstrated.

The diagnosis of a hysterical contracture depends primarily upon the incompatibility of the symptoms with the injury. An injury to a nerve cannot account for persistent spasm of the muscles it supplies and still less for that of other muscles. Persistent muscular spasm resulting from injuries is thus invariably hysterical unless the pyramidal tracts in the brain or spinal cord have been directly damaged.

If the posture is due to the perpetuation by suggestion of a position which developed under circumstances which placed the limb into a position the patient could not voluntarily assume, its maintenance for a more or less prolonged period before the responsible circumstances cease to be operative would be sufficient to train the muscles involved to continue to act in the same way. It would also lead to the development of postural lengths of the muscles which would help to keep the part in the abnormal position even after psychotherapy had resulted in a cure of the contracture and paralysis.

Treatment begins with a full explanation of the cause of the symptoms in language suited to the patient's intelligence and degree of education, followed by persuasion and re-education combined in most cases with manipulation, which doubtless acts to some extent by suggestion. A very important, but by no means essential, preliminary is the creation of a proper atmosphere of cure. The patient is made to understand that any treatment he has already received has prepared the way so that nothing now remains but a properly directed effort on his part, with the physician's help, for complete recovery. During the whole course of treatment he



is engaged in conversation and the meaning of each successive step is carefully explained. He is made to watch the contractions of the muscles and the play of the tendons of the normal limb and to attempt to imitate them in the affected one. In some cases it is not even necessary to touch the patient, mere explanation and persuasion being sufficient to cause him to relax any spasm which may be present, and then to perform the various movements of the part with quickly increasing strength and rapidity.

When very great difficulty is experienced in getting the contracted muscles to relax, the limb should be placed in very hot water and the manipulations carried out when the circulation has been artificially improved in this way. Some relaxation always occurs because the rigidity is in part the direct result of the deficient blood supply. Passive movements are most effective if carried out by the medical officer himself while the patient is engaged in conversation the whole time and made to take an active part in the movements from a very early stage in the first sitting. For this reason the author never employs the mechanical appliances for performing passive movements which have been so frequently advocated. L. C. DONNELLY.

**Morton, W. C.: The Treatment of Functional Disability of the Limbs in a Special Military Surgical Hospital.** *Brit. J. Surg.*, 1919, vi, 497.

The author gives full reports of 44 cases of functional disability, illustrating them with photographs.

Each patient is examined for the first time privately and no one is treated in such a way as to lead him to believe that his disability is not regarded as a very real condition.

After he has explained what he cannot do, he is asked about occurrences previous or subsequent to the development of the disability which might have some bearing on the case. The limb is then examined for œdema, scars, deformities, abnormal posture, involuntary movements, etc. The movements which the patient cannot execute voluntarily in a perfectly normal manner are noted. In every case the whole limb is examined as, in drop-foot for example, both the leg and the thigh may be involved and weakness of abduction at the hip-joint may have caused the pelvis to drop to the opposite side. The muscles not functioning properly are noted and the attention is directed to their

condition both when the patient is at rest and when he is attempting movements.

In arriving at a diagnosis it is determined how much of the trouble is organic and whether there is or has been any direct injury to the muscles themselves, the bones upon which they are intended to act, or the upper or lower neurones by which they should be controlled. It is borne in mind also that the condition may be due to such a lowering of the tone of the whole muscular system that the muscles which have been subjected to the greatest strain in the course of evolution (for example, the peronei or the abductors of the hip) can no longer "carry on." It is remembered also that there may be indirect organic trouble, a painful or protective reflex causing spasm, or an œdema which hampers the muscles partly by causing faulty nutrition and elimination of by-products and partly by thickening and stiffening the muscles themselves. Another possibility is that the muscles may have been so long out of use that their sensory mechanism is out of order. In some cases the condition may be traced to an alteration in the equilibrium of the body due to the shortening of a limb which causes a pelvic drop and scoliosis or an injury which results in scoliosis followed by pelvic uptilt and an apparent shortening of a limb. In other instances a loss of the normal muscular antagonism through a direct injury of the antagonists and their nerves may be responsible.

In every case the facts and difficulties are carefully explained to the patient. If any part of the disability is incurable, he is frankly told so. The rest of the trouble he is told is due to the muscle habit and is curable. As far as possible he is informed how long it will take to cure him—whether one lesson will be sufficient, one day, one week, or one or more months. Emphasis, however, is laid on the fact that a great deal depends upon his own efforts.

Although the methods of treatment vary according to the nature and site of the disability, they are all based upon the same principles, i.e., stimulation of the muscular sense, restoration of the reciprocal action of the antagonists, and co-ordination of all of the muscles under the perfect control of an educated nervous system. Each muscle must be taught to function properly, to contract and relax at will, and by acting at the proper moment with the proper degree of force, to secure complete co-ordination. L. C. DONNELLY.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Sauvé, L.: Six Secondary Laminectomies for War Wounds** (Six cas de laminectomies secondaires pour blessures de guerre). *Bull. et mêm. Soc. de chir. de Par.*, 1919, xlv, 804.

The author gives the clinical histories of 6 cases in 5 of which the presence of a projectile in the spinal column caused more or less serious com-

plications which rendered extraction necessary. In the remaining case a laminectomy was required because of a spinal fracture which caused the phenomena of compression of the spinal cord.

The 6 cases of laminectomy ended in recovery although in 3 of them it was necessary to open the subarachnoid space. In some instances the im-



provement was observed very soon after the operation.

In all of the cases reported Sauv  combined laminectomy with extraction of the projectile under the intermittent control of the radioscopic screen. This method always enabled him to extract the projectile through the smallest possible opening in the spinal column which gave access to the canal. In the majority of cases it enabled him to limit the operation to a hemi-laminectomy which, while giving sufficient opening for the extraction of the projectile, was rapidly executed and did not injure the solidity of the column.

In all of the laminectomies Sauv  opened the canal by means of the gouge. The use of the chisel and mallet he believes may cause medullary concussion. The dura was closed without drainage and in no case was a postoperative fistula observed.

W. A. BRENNAN.

**Thorburn, W., and Richardson, G.: The Pathology of Gunshot Wounds of the Spine and Spinal Cord. *Brit. J. Surg.*, 1919, vi, 481.**

This article is based upon autopsies and operations performed in various theaters of war. The dried specimens have been forwarded to the museum of the Royal College of Surgeons of England.

All of the observations were made at advanced bases, a French seaport, Salonika, Mudros, and Malta, and a very few in England, a fact which means that the authors saw few of the most seriously injured patients who died before reaching the base and a fewer number of those who were slightly injured and evacuated to England. The operations were performed in only a selected number of cases.

In civil life, fracture of one or more vertebrae with displacement of the whole column is common. The specimens here reported showed few in which the body was seriously involved. Injuries from direct impact were also few, but may have been observed more frequently at the casualty clearing stations.

There was a wide distribution of fractures through several vertebrae, and remote fractures were numerous. This may have been due to the tearing off of the bony prominences by the traction of a muscle or tendon.

Two chief types of fracture were found, one of them due to crushing and perforation, and the other a fissured fracture with clean cracks. Fractures of the laminae were often associated with a second fracture of the bony ring, usually nearly opposite.

Foreign bodies were found frequently in the bodies of the vertebrae or inside the vertebral canal. In many instances it was possible to trace the track of the missile by the minute fragments seen by roentgenography. In some cases the foreign bodies had slipped down inside the theca.

The authors have classified these injuries according to the angle at which the missile struck the

spine and whether it passed through the spine or not. This classification is as follows:

1a. Cases of fracture by direct impact with retention of the missile in the spine. The fractures were of all degrees, but there was no relation between the severity of the fracture and the injury to the spinal cord.

1b. Cases of fracture by direct impact with complete perforation of the spine. In some instances the injury was very slight while in others it was severe, with marked damage to the bone.

2. Cases in which there had been a tangential blow upon the spine and in which as a rule the vertebral column was not penetrated either by the missile or the fragments of bone. Although the spinal cord was destroyed or nearly so in the cases reported, the theca was not necessarily injured. Frequently when the tangential blow had approached the vertical rather than the horizontal direction, many vertebrae were injured while the cord injuries varied.

As a rule the spinal meninges were untorn unless they had been subjected to direct impact, even when the spinal cord was fatally injured, a condition analogous to that observed in accidents occurring in civil life.

The meninges were very resistant to infection from without. H morrhages were found commonly around the meninges and in a few instances had produced a cicatrix with pressure upon the cord. No h morrhages had occurred within the cord.

Some of the specimens illustrated how seriously the cord may be injured when there is only a slight osseous lesion. In the cases reported of a type which are often spoken of vaguely as due to "concussion" of the cord, it was evident that the bruising and h morrhage were not always due to osseous displacement, whether with or without recoil. In the author's opinion, such a condition more often resulted from the general disruptive or divulsive wave which is characteristic of gunshot injuries in all regions. The appearance was uniform and similar to that produced by direct crushing of the spinal cord. Serial sections showed a spindle-shaped area of petechial h morrhage with necrosis, tapering above and below the point of impact or the divulsive wave. The destruction was more marked in the gray matter than in the firmer white fibers. A certain amount of o dema was found around the h morrhages, especially in the axis cylinders, and associated with Nissl degeneration of the anterior cornual cells. Intraradicular h morrhages were also present.

No reparative changes were observed even in the body of one patient who survived for twenty-seven days.

The authors conclude that the changes described resulting from the impact of the disruptive wave of a gunshot injury are all contusions of the cord. While they are sometimes spoken of as due to "concussion," they have nothing in common with



cases in which there is a generalized rather than a local effect. The slightly injured patients of course did not die from the cord lesion, and the authors can surmise only that the changes were due to minute hæmorrhages from the divulsive wave.

In the case of one patient who died from other causes a small hæmorrhage was found in the posterior root after symptoms of numbness in the arm which were diagnosed as due to concussion.

G. L. McWHORTER.

## SURGERY OF THE NERVOUS SYSTEM

**Corner, E. M.:** Abstract of the Harveian Lecture on Nerves in Amputation Stumps. *Brit. M. J.*, 1919, i, 638.

Nerves as contrasted with other structures are known to have the power of regeneration. In amputation, the nerve-growth is abnormal, invading tendons, muscles, infected clots, blood-vessels and bone like a malignant tumor and defeating all methods devised to arrest it. Nerves apparently grow through muscle easily and through connective tissue poorly.

The immediate pain after an amputation is due to injuries of the nerves during the operation and passes away in a few days. The early pain after an amputation is due to the participation of their ends in the general repair of the wound. If the wound is infected, neuritis may result. This may be prevented by cutting the nerves short, closing their mouths, and avoiding all unnecessary handling and manipulation.

The causation of remote pain is more complex. Three factors are now known:

1. Inflammation due to infection and the resulting development of islands of fibrous tissue within the nerve. Cultures have been obtained three years after complete healing of a wound.
2. The presence of foreign bodies such as metal, silk, and fibrous tissue.

### 3. The mental factor.

Three rules of practical value to prevent remote pain are: (1) do not use silk in infected wounds; (2) do not keep patients together in homes and hospitals longer than necessary; and (3) get patients back to some kind of work.

G. L. McWHORTER.

**Dales, J. A.:** Plastic Surgery of Peripheral Nerves. *J. Iowa M. Soc.*, 1919, ix, 155.

The author first reviews the structure and function of the peripheral nerves. In the diagnosis of a nerve lesion a careful history and examination, including the response to electric stimuli, are necessary.

There are four surgical lesions of nerves. First, involvement of the nerve in a cicatrix of surrounding tissues; second, partial severance by a bullet or instrument; third, puncture wounds of large nerve trunks by missiles; and fourth, complete severance.

Operation is indicated when there is complete division of the nerve, when the nerve function is injured and repair is arrested, and when there is severe neuralgic pain. Early operation is indicated except in the presence of infection. The best results in restoring a severed nerve are offered by direct union.

I. E. BISHKOW.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABCESES, ETC.

**Erlanger, J., and Gasser, H. S.:** Hypertonic Gum Acacia and Glucose in the Treatment of Secondary Traumatic Shock. *Ann. Surg.*, 1919, lxix, 389.

The authors have made an exhaustive experimental study of shock both in animals and man. From a review of their methods of producing shock it would seem that retarding the circulation in all, or the greater part, of the body is the factor which leads to the development of experimental shock. A study of the blood-volume of animals in shock shows that, regardless of the method by which the shock has been produced, the blood-plasma shows a depletion of about 20.3 per cent. These results confirm the well-known fact that little blood can be obtained from an animal in shock. The reserve

alkalinity, as indicated by the  $\text{CO}_2$  in the plasma of the arterial blood, is reduced in all types of shock, but the reduction is extremely variable. Acidosis, therefore, though probably always present to some degree, can scarcely be regarded as an essential feature in the shock complex.

The necropsies made upon the animals used in the shock experiments invariably showed upon microscopic examination of the intestines that the capillaries and venules of the villi were tremendously distended by solid masses of red corpuscles. Therefore as a result of the slowing of the blood-stream it is probable that the corpuscles, by clumping in the venules and capillaries, choke and dilate them. This in turn still further curtails the blood-flow until the processes of tissue reparation and nutrition may be seriously interfered with. The effective blood-volume is further reduced by the transudation of plasma. Largely, if not exclusively due to the



deficient general circulation resulting from the reduction in the effective blood-volume, the medullary centers, including the vasomotor centers, and the heart, eventually show signs of functional insufficiency.

While making estimations of the blood-volume in shock by the acacia method, it was observed that the concentration of the blood which ordinarily occurs during the development of shock was not nearly as marked in animals that had received a preliminary dose of 20 per cent gum acacia. Wood-yatt and others have shown that hypertonic glucose when given at a subtolerant rate to persons desperately ill has a beneficial action. This also applies to shock.

Theoretically, at least, the administration of a combination of hypertonic gum acacia and hypertonic glucose acts beneficially in several ways: (1) by drawing fluids from the tissues into the bloodstream, thus assisting the normal mechanism in restoring the blood-volume; (2) by maintaining this increased volume through some specific action of gum acacia; (3) by dilating the arterioles through some specific action of the hypertonic crystalloid; (4) by increasing the energy of the heart-beat in the same way, and also by the direct action of the glucose on the muscle; and (5) by augmenting the metabolism through the increase in the supply of glucose to the organism between the limits of basal metabolism and self regulation.

Clinical observations in the treatment of shock-like states in man seem to bear out these theoretical contentions although interpretation is more difficult than in animal experiments. It has been conclusively shown that the same solution when used in man is at least innocuous and the results are strongly suggestive.

GATEWOOD.

**DuBois, E. F.: The Basal Metabolism as a Guide in the Diagnosis and Treatment of Thyroid Disease.** *Med. Clin. N. Am.*, 1919, ii, 1201.

There is only one test that stands out as a rational measure of the degree of hyperthyroidism, and that is the measurement of the basal metabolism.

The basal metabolism of a man is represented by the number of calories he produces in the morning hours, before breakfast, while resting quietly in bed. Usually this is expressed in terms of calories per hour per square meter of body surface. The study of a large number of normal men and women has shown that the level of basal metabolism varies with age, sex, and surface area. There are comparatively few normal persons whose basal metabolism figures are more than 10 per cent above or below the average.

The basal metabolism of patients with high fever is 30 to 40 per cent higher than normal. Also in severe cardiac disease, renal disease, and anæmia it may be high, and in leukæmias with high white-cell counts the heat production may be almost double that of the normal. It is in hyperthyroidism that we find the highest basal metabolism, and

there is a striking parallelism between the severity of the disease and the production of heat. In very severe cases the increase is more than 75 per cent. Conversely, in cretinism and myxœdema the metabolism may be 20 to 40 per cent below normal.

An increased basal metabolism is not pathognomonic of hyperthyroidism, but when taken in conjunction with some of the other symptoms it makes the diagnosis certain, and by watching the fluctuations in the basal metabolism the course of the disease may be followed.

The author presents the metabolism readings of a number of patients made when they were first examined and later after ligation of the thyroid arteries. Under ordinary conditions about three quarters of the heat produced is lost by radiation and conduction from the surface of the body and about one quarter by the evaporation of water from the skin and lungs. Therefore, the increased heat production in hyperthyroidism manifests itself in a warm skin which breaks out into a sweat on slight provocation. To supply all this extra heat large quantities of food are necessary.

The metabolism test has a firm physiological and pathological basis. It is purely objective and cannot be influenced by the hopes of the patient or physician. Since the phenomenon was first discovered by Friedrich Mueller in 1893 and confirmed two years later by Magnus-Levy, its significance has not been disputed, although it has been grossly ignored.

V. C. HUNT.

**Burman, C. F.: The Treatment of Hodgkin's Disease.** *Surg., Gynec. & Obst.*, 1919, xxviii, 440.

Without treatment all recorded cases of Hodgkin's disease have ended in death. There is no authentic report of a spontaneous cure.

Exact diagnosis is necessary for adequate treatment, and such diagnosis rests on the X-ray, blood, and tissue examinations as well as a careful physical examination. In the advanced stages the tissue examination is the most reliable single criterion. In early lesions it may be impossible to distinguish between lymphosarcoma, Hodgkin's disease, simple hyperplasia, and tuberculosis. The author advocates the removal of at least two isolated glands. X-ray examinations are indispensable in determining the presence of mediastinal and chest involvement.

The medicinal treatment of Hodgkin's disease is most unsatisfactory. While under the influence of Bunting and Yates there has been a revival in favor of the surgical removal of Hodgkin's glands, the author feels that the more satisfactory results are due to the X-ray treatment given in conjunction with the operative methods.

The X-ray has a very beneficial effect in ameliorating constitutional symptoms and reducing the tumor, but few, if any, authentic cures by this method are on record.

The author has made use of radium, combining it in some cases with rest in bed, forced feeding, and iron.



Better results are obtained when the tissue examination shows lymphosarcoma than when it shows Hodgkin's disease, and in Hodgkin's disease when polymorphonuclear leucocytosis is not present. Chronic cases are more favorable than acute cases. Intensive prolonged exposures, which are very satisfactory in chronic cases, are quite unsuitable in acute cases. Heavy exposures in acute Hodgkin's disease are usually followed by rapid reduction in the size of the gland masses, but no corresponding improvement in the blood or the patient's general condition. Acute cases treated more than one and one-half years with the heavy-dose method were fatal, with one exception. In chronic cases rest and abundant feeding are of great importance. The most unsatisfactory chronic cases are those with very little glandular enlargement and marked constitutional symptoms and changes in the blood. When the infection is limited to isolated groups of glands, complete disappearance of the glands can be looked for. In chronic Hodgkin's disease the disappearance of the gland masses is almost always accompanied by improvement in health.

The treatment must be so planned that adequate radiation will be applied to all parts of the body affected by the disease, injury to normal structures being avoided and the dose being regulated to the individual case.

The author states that with further improvement in the methods of treatment we may confidently look for permanent cure in an increased proportion of these cases.

V. C. HUNT.

**Broders, A. C.: Basal-Cell Epithelioma.** *J. Am. M. Ass.*, 1919, lxxii, 856.

The cases of basal-cell epithelioma in the series reported represent 13.4 per cent of 2,000 cases of general epithelioma.

Basal and squamous cells can be shown intimately connected in a neoplasm.

It seems to be a well-established fact that a basal-cell epithelioma can change into a squamous-cell epithelioma or at least into an epithelioma in which the squamous cells predominate.

The condition occurs more often in males than in females, the proportion being about three to two in favor of the former. The average age of the patients is 56.7 years. The class of people most often affected are farmers.

A family history of malignancy and a personal history of injury play a negligible part. In 37.1 per cent of the cases there was a previous mole, wart, pimple, eczema, scab, or ulcer.

The duration of the lesion varies from three months to forty-five years, the average being seven years and one month.

It has been found that 96.28 per cent of all the lesions occur above the clavicle.

In the cases reported, 36.19 per cent of the patients had been either operated upon or treated with acids, carbon dioxide, etc., before entering the Mayo Clinic.

In approximately 75 per cent of all the cases treated at the Clinic there was either one excision with the knife alone or one excision with the knife followed immediately by cautery.

Of the 54.1 per cent of patients heard from, 75.86 per cent are living, and of these, 75.45 per cent report a good result.

In the cases in which a good result was reported, 74.68 per cent of the patients had either one excision with the knife alone or one excision with the knife immediately followed by cautery.

The patients who had been treated with acids, carbon dioxide, etc., before entering the Clinic did not obtain as good a result as those who had had no previous treatment.

The low grade of malignancy of the neoplasm is evidenced by its long duration, lack of metastasis in a single case in this series, response to proper surgical treatment, and the fact that 75.45 per cent of the patients reported living have been free from the disease for an average of 6 years, 1.6 months.

Of the patients reported dead, fewer than one-third died from this disease.

The average greatest diameter of the tumors which did not recur after treatment was 1.75 centimeters; of those which showed slight recurrence it was 2 centimeters, and of those not improved by treatment, 3.75 centimeters. In patients known to be dead it was 2.67 centimeters, while in those who died of basal-cell epithelioma it was 4.32 centimeters.

Excessive exposure to sunlight as a cause of the neoplasm has not been borne out by the facts in this series of cases. It was noted that the hand, which is exposed to sunlight at least as much as any part of the body above the clavicles, did not show lesions.

Practically all of the neoplasms in the series reported had their origin in the germinal layer of the epidermis of the skin; only one was demonstrated to have originated from a hair follicle.

## BLOOD

**Dana, H. W.: Theories Regarding Blood-Pressure.** *J. Am. M. Ass.*, 1919, lxxii, 1432.

For a number of years there have appeared from time to time books by various authors purporting to give to the reader a complete understanding of blood-pressure, the causation and the measuring of changes in the various factors, and the blood-pressure conditions to be found in all diseases. Independent observers have also put forth formulæ for the determination of cardiac efficiency by estimations of the blood-pressure.

Recently Dana had the opportunity of studying blood-pressure findings in a large number of army officers and candidates for commissions in the army, chiefly medical officers over 30 years of age. He does not here present statistics as to the distribution of these cases among different age periods,



or as to the classification of the blood-pressure readings obtained, for while these figures might be of interest, such statistics do not help to an understanding of the conditions presented in the individual case. It is his purpose rather to point out some of the conditions met in this mass of material, to discuss the interpretation of the findings, and to suggest a new point of study in the analysis of blood-pressure.

Most of the medical officers examined came to camp from a considerable distance and were examined the day after their arrival without opportunity for rest. Being physicians, they were almost all very nervous over the ordeal of the examination. Most of them were naturally constipated, and this constipation was increased by the journey, the change of routine, and the change of diet. To many, sleep under camp conditions was at first difficult. From all of these causes it was not surprising that a large number of the candidates showed an elevation of the systolic blood-pressure. In a great majority of such cases, however, rest, catharsis, and becoming accustomed to the new routine of life soon brought the blood-pressure down to within normal limits. This observation served to demonstrate in a very striking way the effect of overwork, nervous strain, psychic stimulation, and constipation in raising the blood-pressure.

One fact that impresses the author particularly is the frequency with which a familiar hypertension is observed. Such a condition of continued elevated systolic pressure shared by most members of certain families, a tendency that is apparently hereditary, does not seem in such families to cause invalidism or to shorten life. Indeed, it seems that many such persons continue to have better than normal health and robustness and the hypertension, if not actually the cause of this, at least is associated with their abundance of strength.

Dana states that probably it can be accepted without serious question that the systolic pressure represents the point at which sounds are heard with the stethoscope over the cubital fossa when the pressure in the cuff is dropping, and that the diastolic pressure is the lowest point at which these sounds pass their maximum, i. e., the beginning of the "fourth phase."

The writer argues that the systolic blood-pressure is maintained by vasoconstricting substances in the circulating blood, and an abnormally high blood-pressure indicates that the blood-stream contains either toxic substances (unexcreted products of metabolism or focal purulent processes), or an excessive amount of the vasoconstricting secretion of certain glands of internal secretion. The functional test of cardiac efficiency suggested by the observation of Graupner that when a man has been put through a certain amount of exercise, and when following this his pulse-rate has returned to normal, his systolic blood-pressure as a rule rises, is explained by the theory that there was an increase in the amount of vasoconstricting internal secretion,

liberated perhaps by the thyroid or suprarenal glands as a result of the increased circulation following exercise, rather than on the basis of the condition of the heart-muscle.

The more the author has studied blood-pressure, the less convincing to him are the accepted interpretations regarding the test. Certainly while as much respect is shown for blood-pressure reading as ever, the author feels it necessary to get a new conception as to the factors influencing the readings.

From the observations reported the author draws the following conclusions:

1. Increased systolic blood-pressure indicates the presence in the circulating blood of either unexcreted putrefactive products absorbed from the intestine, kidneys, focal infections in the dental alveoli, the nasal sinuses, the tonsils, or the genito-urinary tract, or of secretions in abnormal amounts from the glands of internal secretion.

2. In some cases at least, lowered blood-pressure indicates a defective secretion of pressor substances or an increased secretion of depressor substances by the ductless glands.

3. When the diastolic pressure fails to conform to its normal ratio with the systolic pressure, it is influenced also by abnormal amounts of ductless-gland secretion in the blood-stream.

4. Neither the systolic nor the diastolic blood-pressure gives any certain indication as to the condition of the cardiovascular renal system as such. When changes in the vascular system are accompanied by hypertension neither condition is secondary to the other, both being secondary to the presence of unexcreted toxic products of metabolism in the circulating blood.

G. E. BEILBY.

#### Leyton, O.: Transfusion in Diseases of the Blood *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Med., 5

The one hundred transfusions upon which this paper is based were distributed most unevenly among ten patients, one patient having had more than fifty transfusions and two only one transfusion each. After it was found that the donor was free from malaria, syphilis, and tuberculosis, he was deprived of food for six hours previous to the taking of the blood, and the recipient was given a hypodermic of morphine and hyoscine one-half hour before the transfusion was begun. The donor's blood was then prepared with 5 per cent sodium citrate and 0.45 per cent sodium chloride solution. The author favored using the same donor as frequently as possible, and in one instance blood was obtained from the same person six times in three months. His reason for this was that he believes the repeated removal of blood leads to the production of some hormone which stimulates the blood-forming cells and might be useful to the patient suffering from aplastic anæmia. None of the donors suffered any ill effects.

In cases of pernicious anæmia five transfusions usually sufficed to raise the number of red cells from two million to more than three and a half



million. The effects were not permanent, however, and within a few weeks the destruction of the cells had caused a drop to below two million again, when other transfusions were given. It was thought that life could be maintained in a small percentage of cases by repeated transfusions, but in many cases the disease was progressive and the patients continued to grow worse until death finally ensued.

P. W. SWEET.

**Kaliski, D. J.: The Use of the Superficial Jugular Veins of the Neck for Intravenous Injections.** *J. Am. M. Ass.*, 1919, lxxii, 1613.

While the veins at the bend of the elbow are preferable for intravenous injections, the external jugular of the neck may be used when they are inaccessible. The author has given intravenous treatment hundreds of times into the superficial jugular veins without bad results.

The patient reclines on a level table without a pillow. Compression applied over the clavicle while the skin over the vein is gently drawn toward the chin makes the vein stand out and fixes it so that the needle enters its lumen readily.

The gravity apparatus is best suited for injections into this vein.

K. L. VEHE.

**Fischer, L.: The Longitudinal Sinus; Its Adaptability in Procuring Blood for Diagnosis; Its Use in the Transfusion of Blood and for Diagnostic Purposes, an Ideal Method in Infancy.** *N. York J. Med.*, 1919, xix, 183.

By the use of the longitudinal sinus we have a direct channel through which a small or large quantity of blood can be taken rapidly from or added to the circulation.

Marfan in 1898 first suggested the injection of a saline solution through the anterior fontanel into the longitudinal sinus.

The author uses the longitudinal sinus for every case to the exclusion of all other methods, and finds it adapted for the abstraction of blood as in venesection, for procuring blood for blood cultures and Wassermann tests, for the administration of salvarsan and normal saline, and for the transfusion of blood.

The infant is placed flat on its back on the table and its head steadied by an assistant while the needle is introduced. As the longitudinal sinus is very near the surface, it is rarely necessary to go deeper than 1 or 2 millimeters. The best needle is one-half an inch long, of a 20 or 22 gauge, and has a short bevel point. After it has penetrated the sinus, sufficient blood may be aspirated for diagnostic purposes or the required quantity of blood or medication transfused.

V. C. HUNT.

**Haessler, H., and Stebbins, M. G.: The Effect of Bile on the Clotting Time of Blood.** *J. Exper. M.*, 1919, xxix, 445.

Although it is known that jaundice tends to delay the clotting of blood, the cause of the delay is not

known. Minot and his associates, using Howell's method of recalcifying oxalated plasma, found that the coagulation time (prothrombin time of Howell) was increased in a series of jaundice cases, but did not suggest an explanation of the mechanism of the delay. It seemed to the authors of interest, therefore, to determine whether or not the bile and bile salts present in the blood in jaundice are in themselves capable of causing the increase in the coagulation time. The following experiments on cats were therefore undertaken:

Series 1. Cats under ether anæsthesia were bled from a large artery through a paraffined cannula into paraffined 50 cubic centimeter centrifuge tubes containing 7.5 cubic centimeters of 1 per cent sodium oxalate in 0.9 per cent sodium chloride solution. The tubes were then centrifugized and the plasma carefully pipetted off. If the plasma showed the least trace of hæmolysis it was rejected. A series of flat-bottom tubes, 22 millimeters in diameter and each containing 2 cubic centimeters of plasma and 0.5 cubic centimeter of an ox-bile solution of varying concentration, was then set up. To each of the tubes an amount of calcium chloride was added which previously had been found to produce a firm clot in the minimum length of time with the same plasma.

The time necessary for the formation of a firm clot in each tube was recorded. Precipitation of fibrin was considered complete when a clot of such consistency was formed that the tubes could be inverted without loss of liquid.

Series 2. In these experiments a solution of sodium glycocholate was substituted for the bile. Otherwise, the experiments were identical with those of Series 1.

Series 3. In these experiments 0.5 cubic centimeter of a solution of fibrinogen was used to which bile had been added to the desired concentration. An excess of thrombin was then added and the clotting time noted.

From the above experiments it is evident that, within certain limits, clotting time depends on the percentage of bile present in solution and that the reaction is the same with pure solutions of the substances concerned in coagulation as in whole plasma. It likewise seems justifiable to conclude that bile and bile salts do not interfere with the formation of thrombin, since the prolongation of clotting time is just as great when preformed thrombin is added in ample quantity to fibrinogen solution as when thrombin must be formed from its precursors in the presence of bile. It cannot be a question of destruction of the thrombin as Morawitz and Bierich showed that a quantity of freshly drawn blood which had been mixed with sufficient bile to inhibit clotting could be caused to coagulate by merely diluting the mixture with isotonic salt solution. Consequently we must assume that it is the conversion of fibrinogen to fibrin that is interfered with rather than the formation of thrombin.

It was found that there was a retardation of



clotting great enough to be detected by clinical methods with amounts of bile greater than 5 per cent. The authors were unable to find reports in the literature stating the exact amounts of bile salts present in the blood in jaundice. Gilbert states that in cases of obstructive jaundice bile pigment is present in the blood in quantities of from 0.7 to 1 gram per liter. Bile itself contains about 1 gram of pigment per liter. The relation of bile pigments and bile salts in the blood in jaundice has not been determined, but it would seem possible that the salt is present in sufficient concentration to prevent clotting.

The conclusions drawn are as follows:

1. Within certain limits the clotting time of blood, blood plasma, and solutions of fibrin to which bile salts have been added is proportional to the quantity of bile present.
2. The bile interferes with the conversion of fibrinogen into fibrin and not with the formation of thrombin.

G. E. BEILBY.

**Vecki, V. G.: The Use of Intravenous Injections of Mercuric Chloride in the Treatment of Suppurating Infectious Diseases. *J. Am. M. Ass.*, 1919, lxxii, 1596.**

The author has used mercuric chloride intravenously in gonorrhœal rheumatism and other complications of neisserian infection, in erysipelas, in various acute and chronic suppurative conditions, including furunculosis, carbuncle, anthrax, and adenitis, and in influenza.

The dose varies, but is usually between 3 and 5 cubic centimeters of a 1:1000 solution. The number of injections also varies from one to five or more. Two centigrams of mercuric chloride were given intravenously to a patient with severe anthrax who recovered, but had mercurial poisoning. A patient suffering from severe cystitis and pyelitis probably had a mercury idiosyncrasy as acute poisoning resulted from 3 milligrams of the bichloride.

K. L. VEHE.

## POISONS

**Goadby, K.: Latent Infection of Healed Wounds. *Lancet*, 1919, cxcvi, 879.**

This report summarizes work on postoperative flares, with special reference to latent infection in healed and unhealed wounds which comprised cavities containing metal fragments, wounds of the soft tissues, sequestra, etc. In studying the incidence of bacteria in 226 wounds, the facultative anaerobic streptococci were found to preponderate.

The histologic examinations demonstrated that in practically all wounds caused by shell fragments some degree of gas infection had taken place. While in none of the cases from which the tissue was taken was this infection diagnosed clinically, the evidence of the condition—alteration in staining and wide separation of the muscle-bundles—was

unmistakable although in only a very few instances were the actual organisms seen.

The point of practical importance in the healing of gas-infected tissues is the space left between the muscle-bundles and the gradually forming fibrous tissue in which the organisms remain latent. Both anaerobic bacilli and streptococci have been shown to persist in tissues removed from healed wounds as long as one thousand days after the receipt of the wound.

An effort was made to control the flares arising from operation upon such cases by preliminary immunization. Polyvalent vaccine was used which was prepared from as many strains of streptococci as possible, obtained from latent infection, grown on human blood, and sensitized with polyvalent streptococcal serum. Fifty patients received the vaccine immunization previous to operation and 45 were not immunized. Eight of the 50 immunized patients showed a temperature reaction as against 36 of the 45 unimmunized patients. Therefore the chances for uneventful recovery as far as infection is concerned were five times better after vaccination.

P. W. SWEET.

**Hartsell, J. A., and Morris, M. L.: Report of Sixty Cases of Wound Diphtheria and Bacteriological Appendix. *J. Am. M. Ass.*, 1919, lxxii, 1351.**

Hartsell and Morris report 60 cases of wound diphtheria which occurred in an army hospital in France.

Before the onset of the wound diphtheria there had been numerous cases of throat diphtheria in this hospital. While the latter condition never approached a real epidemic, its incidence was greater than would be expected in a hospital community. Most of the throat cases were in one ward. From Oct. 14, 1918, to Feb. 1, 1919, 11 cases of true throat diphtheria and ten carriers were found in this ward, and it was here that the outbreak of wound diphtheria centered.

The first case of wound diphtheria appeared in a large debrided wound of the thigh. This wound was of several weeks' standing and had been doing well under Carrel-Dakin treatment until November 20, when it suddenly showed a gray-black membrane. Cultures made at this time and December 9 and 12 were negative. Another culture made on December 13, however, was positive. Subsequent cultures were positive up to December 31, and then remained negative.

On December 13 when cultures were made from all the wounds in the ward 18 were found positive. The ward was immediately placed under strict quarantine and the most careful wound technique established.

The results of a study of the 60 cases were as follows:

1. In none of the wounds were there any systemic symptoms referable to diphtheria toxin. Most of the patients were well in every way and none showed any elevation of temperature other than that



which might well be explained as being due to a large debrided wound.

2. The clinical appearance of the wounds varied. Twelve per cent showed a gray membrane quite typical of diphtheria. About one-half showed only a faint grayish discoloration of the granulating surfaces which under ordinary conditions would have passed unnoticed. About 6 per cent looked absolutely normal and ready for secondary closure.

3. So far as could be observed, the presence of diphtheria bacilli in a wound had no effect at all on its healing. Wounds which were slow to heal invariably had large numbers of other organisms present. Wounds which appeared clear progressed in the ordinary way. Two wounds were positive up to the date of complete healing.

4. Forty-three patients received the Schick test and the results in six instances were positive. This is about the percentage for all adults.

5. The resistance to treatment varied greatly. In some cases the diphtheria disappeared with two days' intensive treatment, while other cases were very resistant, three remaining positive for forty-nine, forty-two, and twenty-four days, respectively, in spite of all treatment.

6. By far the most efficient treatment has been the use of tincture of iodine. Under the most rigid asepsis the wound was cleaned with a 1 per cent soap solution, ether, and alcohol, and then painted with U. S. P. tincture of iodine, care being taken to protect the surrounding skin. Under this treatment the average duration of positive cultures was six days. Fifteen cases cleared up within forty-eight hours and only eleven remained positive longer than one week.

Diphtheria antitoxin, up to four doses of 20,000 units each, was given in four cases, but had no effect. It was never necessary to give it for its systemic protection. Diphtheria antitoxin as a wet dressing was used in two cases, but without effect.

Acetic acid was given a thorough trial in four cases, but was also of no value.

Two wounds cauterized for a few seconds with phenol were reported positive the next day.

The Carrel-Dakin method, applied very exactly in eight cases, was a failure in six.

In studying the bacteriology, only such organisms as showed the typical morphologic characteristics were called diphtheria bacilli. The stain used was Loeffler's alkaline methylene blue, and microscopically it showed the organisms taking a blue stain throughout except at the extremities. The bodies either appeared granular (fine) or had the striped appearance so often noted. The clubbed ends took on a more violaceous hue and were homogeneous. Some showed a central swelling.

Soon after precautions were taken, the incidence of throat diphtheria fell until in the period from January 1 to February 1 no further cases developed in the ward.

G. W. HOCHREIN.

McCalla, A. I.: Actinomycotic Infection. *Canadian M. Ass. J.*, 1919, ix, 411.

According to McCalla, the whole subject of actinomycotic infection is shrouded in darkness and uncertainty. In his article he discusses the subject under seven headings: definition, history, etiology, pathology, symptomatology, prognosis, and treatment.

Actinomycosis is defined as a subacute or chronic, local or generalized infection brought about by a specific microorganism, the actinomyces bovis, and resulting in necrosis and suppuration with the production of much granulation and connective tissue.

The organism was first seen by von Laugenbeck in 1845. The botanist, Harz, gave it the name "actinomyces" or "ray fungus." Since 1880 much work has been done, particularly by Wright, of Boston, but his findings are not everywhere accepted.

In its spread, the disease does not follow the fibrous and muscular planes of the body, but invades everything in its path, in this way resembling a malignant growth. The amount of connective tissue found is often enormous and far exceeds the size of the colonies of the microorganisms.

Healing may occur at one point when the disease is spreading at another. Irregular scar formation results. The disease spreads either by direct extension or by metastasis, through the invasion of the blood-vessels and the breaking off of masses of the mycelium. Secondary infection by the pus-producing cocci is exceedingly common. There is often glandular enlargement due to the suppurative processes, but the glands are never involved by the growth of the organism.

About 60 per cent of all cases are related to the mouth and pharyngeal cavities. In most instances infection probably occurs through carious teeth and may spread by direct extension to the bones of the jaw or the face. During the spreading the soft parts are involved and pus cavities are formed which, breaking on the surfaces, produce sinuses.

The bones of the skull and the brain may also be involved. In 15 per cent of cases the condition occurs in and about the thorax. Abdominal actinomycosis constitutes about 20 per cent of all cases. Beginning in the mucosa, usually of the cæcum or the appendix, the disease spreads through the wall of the gut involved, advances rapidly through and between the coils of bowel, forming masses of granulation tissue, and later, connective tissue. As it progresses, central necrosis of the masses is produced, resulting in the formation of abscess cavities.

A few cases of primary actinomycosis of the skin have been observed.

There is no definite symptomatology, but symptoms result from the tumor formation and suppuration. In abdominal cases the attention is often first called to the disease by the presence of a mass. At times the condition begins as an acute appen



dicitis. About the head it may occur as an acute illness with swelling, pain, and rise of temperature, but more often a mass develops slowly with very little discomfort except that due to the tumor itself. In the chest the symptoms are those of destruction of tissue with abscess formation. As long as the condition is confined to the lungs, the symptoms are very few. If a bronchus is opened, there is cough with expectoration in which the organism may be found. When the pleura is involved, there is pain. Actinomycosis usually affects the base of the lung, whereas tuberculosis is found in the apex.

The prognosis of the condition depends upon the site and extent of the lesion. In cases involving the head and neck, probably 75 per cent of the patients recover. In the thoracic type, the outlook is exceedingly bad. In the abdominal type the prognosis is unfavorable but better than in the thoracic form of the disease.

Recurrences are not rare, even after apparent cure. Two years should elapse before it should be assumed that the cure is definite.

The treatment resolves itself into three forms, surgical and medical, and treatment by radiation. In the surgical treatment the abscesses should be drained, sinuses curetted, and isolated foci removed, when possible, as in the early actinomycosis of the appendix. In all cases, whether possible or not to begin with surgical procedure, potassium iodide should be administered in large doses for long periods of time. Roentgen rays and radium when combined with surgical and medical treatment are supposed to have a beneficial effect in the limitation and cure of the disease.

The author cites five cases. G. W. HOCHREIN.

**Watson, A.: Case of Death from Scorpion Stings.**  
*Lancet*, 1919, cxvii, 889.

Death resulting from scorpion stings is unusual. The following case presented some interesting features.

Private C., who was serving with his battalion in a forward area in Mesopotamia, was brought to the regimental aid-post about 11 o'clock one night suffering from scorpion stings. He was a small, slightly built man, aged 21. He stated that he had just been stung three times on the buttocks and thigh by a green scorpion which measured about 3 inches from the head to tip of the tail. The scorpion had been killed and was produced.

The patient appeared somewhat nervous and complained of a tingling "pins-and-needles" sensation all over, but otherwise his condition was quite good and he had no pain. He was given some brandy and detained in the aid-post for the night. Shortly afterward he fell asleep and slept for some hours.

His pulse and temperature were taken in the usual routine about 5 o'clock next morning; both were normal, and he appeared to be in good condition though he still complained of the "pins-and-

needles" sensation all over his body. About an hour later he suddenly became collapsed. He was conscious, but very weak. There was a cold sweat on his forehead, his temperature was subnormal, and his pulse was slow and feeble. He was given strychnine and digitalin hypodermically and brandy and hot oxo by mouth. His condition rapidly improved and he was ordered brandy hourly and hot oxo every two hours. By mid-day he appeared to be out of danger and was taking quite an interest in what was going on around him. Treatment, however, was continued. At 4.15 p. m. he suddenly collapsed and died in a few minutes.

**EXPERIMENTAL SURGERY AND SURGICAL ANATOMY**

**Kahn, M. H.: Tests of the Functional Capacity of the Circulation.** *Am. J. M. Sc.*, 1919, clvii, 634.

Comparative functional tests of the circulation were made in 233 cases, including the normal, the various tachycardias, sinus bradycardia, thyrotoxic conditions, neurocirculatory asthænia, etc. The characteristic finding in simple tachycardia, compensated mitral regurgitation, and sinus bradycardia was the absence of any effect upon the pulse-rate or only a very slight increase after exercise.

In thyrotoxic hearts the characteristic effects were marked instability of the pulse-rate with great increase after exercise, associated with instability of the diastolic blood-pressure.

A similar effect, but less distinct, was found in neurocirculatory asthænia. In the latter condition it was noticed on auscultation that the thrill disappeared when the relationship of the apex-beat to the chest wall was disturbed or distorted. The tremogram recorded this as a differential point between neurocirculatory asthænia and the thyrotoxic conditions. Hypertonicity of the heart muscle is the physiological basis of the cardiac signs of neurocirculatory asthænia.

Thyrotoxic conditions and nephritic hypertension lessen the functional circulatory capacity. Aortic regurgitation and congenital heart lesions give fairly distinct features.

MAX KAHN.

**Steinfeld, E.: The Plasma Chlorides in Anæmia: an Experimental Study.** *Arch. Int. Med.*, 1919, xxiii, 511.

The chloride concentration in the plasma of the dog is raised during the active stage of infection with *T. equiperdum* at the period when anæmia is a prominent feature. This is not dependent on retention due to impaired ability of the kidneys to excrete chlorides.

In one observation, uranium nephritis in a dog which was rendered anæmic by *T. equiperdum* was followed by a still higher concentration of the plasma chlorides associated with a definite impairment of the renal capacity for excreting chlorides.

MAX KAHN.



**Jackson, C. M., and Stewart, C. A.: The Recovery of Normal Weight in the Various Organs of Albino Rats on Refeeding after Underfeeding from Birth for Various Periods.** *Am. J. Dis. Child.*, 1919, xvii, 329.

Previous research by the authors and others has shown that in young animals underfed for various periods of time remarkable changes occur in the weight of the various organs of the body. There is also evidence to indicate that similar changes occur in malnourished human infants. While some organs during inanition tend to maintain approximately their normal relative weight and others continue to grow, still others undergo losses. The organs affected and the extent of the changes involved vary according to the age of the individual and the length and character of the inanition.

There naturally follows the question as to the process of recovery on abundant refeeding after various periods of inanition. Stewart has already shown that rapid recuperation occurs in rats refed after being held at maintenance (constant body weight) from the age of weaning (3 weeks) to about the age of puberty (10 to 12 weeks). The various organs and parts usually recover their normal relative weights within four weeks of refeeding. The object of the investigation reported was to determine the extent of recovery on similar refeeding of rats which have been underfed from birth, during a period when the changes due to underfeeding are much greater than later. The results may perhaps indicate the probability of recovery in the various organs of infants after periods of inanition, a clinical problem of obvious importance.

From the data in the present series of refeeding experiments, the following provisional conclusions are indicated:

1. In albino rats underfed from birth to 3, 6, or 10 weeks of age, rapid growth in body-weight ensues on ample refeeding. Body-weights of from 25 to 75 grams are apparently reached more rapidly in those refed after underfeeding to 10 weeks of age than in those refed after underfeeding for shorter periods.

2. The length of the body remains slightly above normal in the group refed to 25 grams body-weight, but appears nearly normal in the others. The length of the tail and the weights of the head, limbs, and trunk appear nearly normal in all the refed animals.

3. As to the body systems, the integument appears subnormal in weight in the group refed to 25 grams, and usually normal or above in the others. The ligamentous skeleton appears nearly normal in all refed groups, but the cartilaginous skeleton (moist or dry) tends to be subnormal in weight. The musculature is nearly normal in weight, with a slight apparent deficit in the later refeeding periods. The visceral group (as a whole) and the remainder show no constant or significant variations in the refed animals.

4. The individual organs differ greatly in the extent to which they recovered their normal weight (compared with that in controls of the same body-weight) in the various groups refed to a body-weight of 25, 50, or 75 grams after underfeeding from birth to 3, 6, or 10 weeks of age. The weights of the various organs in the refed rats were as follows:

The hypophysis and suprarenal glands were apparently nearly normal in weight in all groups; likewise the heart, lungs, and kidneys, excepting an apparent overweight (of doubtful significance) in the groups refed after underfeeding to 10 weeks of age. The liver was rather irregular in weight, but probably within the range of normal variation.

The brain, spinal cord, and thymus appeared almost constantly subnormal in weight in all test groups. The apparent loss in the pineal body was of somewhat uncertain significance. The thyroid gland appeared subnormal on refeeding to 25 and 50 grams after underfeeding to 3 weeks of age; otherwise it was normal. The ovaries varied in weight and were apparently subnormal in the animals refed after underfeeding to 10 weeks of age. The epididymis appeared subnormal on refeeding to a body-weight of 75 grams.

The empty stomach and intestines were usually above normal weight in the refed groups. With contents they appeared more nearly normal in weight. The length of the intestines was somewhat above normal on refeeding to 25 grams of body-weight and nearly normal later. There was little change in the relative lengths of the large and small intestines. The eyeballs showed a slight overweight, of doubtful significance.

Two organs showed an apparent tendency to overcompensatory growth in the earlier stages of refeeding, with later retardation. The spleen was greatly above normal weight at a body-weight of 25 or 50 grams, but normal or subnormal at a body-weight of 75 grams. The testes showed a similar reaction, the apparent atrophy in the later stages of refeeding being especially marked.

G. E. BEILBY.

**Clark, A. H.: Effect of Diet on Healing of Wounds.** *Bull. Johns Hopkins Hosp.*, 1919, xxx, 117.

The work of Hooper and Whipple on blood regeneration after anæmia shows that specific diets produce a very marked effect. The rate of blood regeneration on a meat diet is very rapid, a matter of days or a few weeks, whereas on a diet rich in carbohydrates it is very slow, months being sometimes required for complete regeneration. These results suggest the possibility that specific diets might exert some influence upon the rate at which wounds heal.

Carrel has studied the process of wound healing in both men and animals and has found that the curve representing the diminution in size of an aseptic wound while it is cicatrizing is regular and geometrical. From Carrel's curves DuNouy has derived mathematical formulæ by means of which



the area of a wound at any given date can be predicted.

When in Carrel's experiments on animals (dogs, guinea-pigs, and cats) the wounds were kept as sterile as possible, he found the process of cicatrization to be divided into four stages:

1. The quiescent period: During this stage there is no contraction and the main characteristic of the period is its variable length, one to five days.

2. The period of granulous contraction: During this period the wound contracts at a rate which is proportional to the size of the wound.

3. The period of epidermization: The epithelium begins to form and the process of healing may continue by epidermization alone or by epidermization and contraction together.

4. The cicatricial period: After the wound is healed the scar enlarges.

To determine the effect of specific diets on wound healing the author carried out the following experiments:

Twelve dogs as nearly the same age, size, and general condition as possible were chosen and three put on each of the following diets:

1. Mixed diet: 41 grams of fat (lard or butter) and 107 grams of lean meat (beef or liver) boiled together, then mixed with 354 grams of bread and run through a meat chopper. This was divided among three dogs.

2. Carbohydrate diet: 500 grams of bread moistened with water, divided among three dogs.

3. Protein diet: 500 grams of lean meat, either round of beef or liver, boiled and divided among three dogs.

4. Fat diet: 300 grams of fat (equal parts of butter and lard) boiled and ground with 100 grams of bread.

The dogs were fed on these diets for three days before the wounds were made. Throughout the experiments they were weighed and the weights were found to remain practically constant. A second set of wounds was made after the first had healed, and finally a third set, the diets being interchanged.

In connection with the results it is interesting to consider the well-known fact that the ingestion of proteins produces a much greater increase in body metabolism than that of any other foodstuffs. In a recent monograph on the stimulating effects of nutrients, Benedict and Carpenter have given a very complete report on this question. They find that while carbohydrates give a maximum increment to the metabolism of 25 per cent, and fats 12 per cent, this increment occurs within two hours and the metabolism then returns rapidly to the base line. With proteins the increment reached a maximum of 25 to 45 per cent and persisted for as long as eight to twelve hours. This increase in metabolism, or excess energy given off by the body as a result of the ingestion of food, may be regarded as waste energy, but Benedict suggests that we may consider the extra heat developed under these conditions as a normal physiological stimulus to cellular activity.

Practical experience with heavy muscular work on protein and carbohydrate diets points to this conclusion, and the results reported here would certainly support the theory that proteins have a specific influence in stimulating the whole cellular system to greater activity.

From the foregoing experiments the author concludes as follows:

The length of the quiescent period of wound healing is affected by the diet. It varies from zero in protein-fed dogs to six days in fat-fed animals. This variation is more marked in smaller wounds. As a consequence, the date of final healing in the protein and fat-fed dogs differs by about five days.

When the second period, or period of contraction, has set in, the rate of contraction is not affected by the diet. It is governed rather by a variable factor depending on the age of the wound and by a constant factor proportional to its original size:

$$\frac{R_1}{R_2} = \frac{S_1}{S_2} \text{ when } R_1 \text{ and } R_2 = \text{rates of healing of large}$$

and small wounds, and  $S_1$  and  $S_2$  = original areas of these wounds.

The beginning of Period 3, the period of epidermization, is independent of the size of the wound and the diet, and is determined by the age of the wound. Contraction and epidermization continue together until the wound is entirely healed.

After the wound is healed, the scar continues to contract until pigmentation sets in. During the latter process it enlarges and reaches a stationary state after pigmentation is complete.

G. E. BEILBY.

**Myers, J. A.: Studies on the Mammary Gland. The Effects of Inanition on Developing Mammary Glands in Male and Female Albino Rats from Birth to Ten Weeks of Age. *Am. J. Dis. Child.*, 1919, xvii, 311.**

In a previous work attention was called to the fact that the postnatal development of the milk-ducts probably depends to some extent on the body-weight of the animal. The present work is an attempt to show: (1) to what extent the postnatal development of the milk ducts may be altered by changes in the normal body-weight of the animal; (2) the effect of severe inanition on the development of all parts of the mammary gland; and (3) the recovery of the mammary gland in animals when they are refed after inanition.

In the present study it was found that the mammary glands apparently responded somewhat slowly when the animals were refed after underfeeding from birth to about three weeks of age. In fact, the response was so delayed that they did not reach the stage of development ordinarily attained at the time of puberty (at about the eighth or ninth week of age) until the refed rat was about 18 weeks old. Stewart showed that in rats which were underfed for short periods, beginning at the time of weaning (when they were 3 weeks old) or



later, the integument and ovaries recovered very rapidly when the animals were refed. Later, however, Jackson and Stewart showed that when the underfeeding is begun at birth and continued three weeks or longer, a permanent stunting of the body usually occurs.

In view of the great individual variation in the development of the mammary glands at any given age or body-weight (as shown by Myers), it is hazardous to draw any final conclusions from the relatively few cases observed in the present study. Apparently, however, the mammary glands in the underfed young rats, though temporarily lagging somewhat behind the body-weight when the rats are fully refed, may ultimately attain a normal degree of development.

The author summarizes the article thus:

1. Severe inanition retards the growth of the milk-ducts of the female rat during the first week, but apparently does not completely stop their growth. In animals held at birth weight for a longer time the ducts cease to grow and remain in a condition slightly more developed than at the time of birth. If after the first week the gross body-weight of the animals is allowed to increase so as to correspond to that of a normal animal one week old, the milk-ducts fail to develop to the same extent as those of a normal animal of corresponding body-weight. This holds true also if the body-weight of the underfed rat is allowed to equal that of a normal animal two weeks old.

2. The lumen of the primary duct in underfed rats does not communicate with the exterior through the milk-pore until the tenth week.

3. The growth of the milk-ducts of male rats is retarded by inanition in a manner similar to that observed in the female.

4. The nipple grows little during inanition, being elevated above the surface only slightly in young rats starved severely for eight to ten weeks. The epithelial processes fail to develop much beyond the stage reached at birth, and the sulcus around the base of the normal nipple remains shallow.

5. The subcutaneous fat that appears very early in the neighborhood of the milk-ducts soon becomes greatly decreased after the amount of food is reduced to a minimum.

6. In all, the retardation in the development of the mammary gland is roughly proportional to the retardation in body-weight, at least within the limits of normal variability.

7. Severe inanition for a short time at an early age thus temporarily stunts the mammary glands. When the animal is refed the glands respond slowly. When the body-weight during refeeding reaches that of a normal rat at the age of puberty, the milk-ducts are far behind those of the normal rat of corresponding body-weight. That this stunting is not permanent is shown by the fact that the ducts ultimately attain the same stage of development as those of a normal animal, but at a much later period.

G. E. BEILBY.

Stewart, G. N., and Rogoff, J. M.: The Action of Drugs upon the Output of Epinephrin from the Adrenals. I. Strychnine. *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 95.

Stewart and Rogoff have determined experimentally on dogs and cats that strychnine produces a prolonged increase in the output of epinephrin. The accumulation of epinephrin in the glands as well as its liberation is increased. This is what occurs during stimulation of the splanchnic nerve, except when intermittent stimulation is long continued. Accordingly, the effect of the strychnine seems to be produced not by direct action upon the glands but by an intensification of the secretory process through the normally governing nervous mechanism.

The conclusions are all based on assays of adrenal blood with rabbit intestine and uterus segments, corroborated by the study of the effects produced on the blood-pressure by adrenal blood collected in a cava pocket and introduced into the circulation in various ways.

It is pointed out that the technique employed in measuring variations in the epinephrin output must take into account concomitant changes in the rate of the blood-flow as well as changes in the concentration of epinephrin in efferent adrenal blood.

The increased output observed was as much as ten times the normal amount, and it is possible that the samples tested did not contain the maximum increase. The increase was found to persist for one to one and one-half hours, beyond which time the experiments were not prolonged. The last samples of blood, especially with the smaller doses, sometimes showed an output of epinephrin as great as or greater than that shown by any of the earlier specimens.

A considerable increase was produced by doses of strychnine well within the therapeutic range. The minimum effective dose was not sought. The increased output was associated with a variable increase in epinephrin concentration even when the rate of blood-flow through the adrenals was increased, though never to a degree greater than the maximum normal concentration. Without strychnine under similar experimental conditions no increase in epinephrin output was detected.

The increased rate of output was occasionally preceded by a transient diminution, especially with smaller doses given subcutaneously. Larger and intravenous injections probably masked the preliminary decreased output. W. H. NADLER.

MacNider, W. D.: A Functional and Pathologic Study of the Chronic Nephropathy Induced in the Dog by Uranium Nitrate. *J. Exper. M.*, 1919, xxix, 513.

Since the initial observation in 1888 by Chittenden and Hutchinson that uranium salts will induce acute nephropathy, these substances have been extensively used as acute nephrotoxic agents. Little is known, however, regarding their effect on the kidney in prolonged intoxications. Such obser-



vations as have been made are largely concerned with the type of the pathologic response on the part of the kidney and the processes of repair which take place during its recovery from the acute injury.

The investigation here reported was undertaken with the object of studying the functional capacity of the kidney during the period of acute injury from uranium and also the period when it is recovering from the acute degeneration and passing into a stage of chronic injury characterized by such changes in structure that the condition may be considered to represent some type of chronic nephropathy.

In previously published papers the observation has been made that the acute injury from uranium to the normal kidney or the naturally nephropathic kidney is associated with the development of an acid intoxication. In the present study observations were made of the changes in the acid-base equilibrium of the blood of the animals not only during the period of acute damage to the kidney, but also during the period of recovery from such an injury, when it was possible to study the relation of the changes in the blood to the processes of repair and the return of the functional response of the kidney.

Twenty-seven female dogs were used. The animals varied in age from 5 months to 10½ years. For four days prior to the beginning of the intoxication they were kept in metabolism cages. During this period, studies of the urine, blood, and functional capacity of the kidneys were made in order to eliminate animals which had a naturally acquired nephropathy. All of them were free from renal disease. They were given 500 cubic centimeters of water daily, and fed on bread with a small amount of cooked lean beef. Once a day they were catheterized and the amount of urine obtained was added to the cage urine for analysis. The experiments were terminated at various periods during the intoxication without the use of an anæsthetic, this method eliminating the development of acute degenerative changes in the liver as well as in the kidney. The animals were poisoned with a dose of 4 milligrams of uranium nitrate per kilogram of body-weight, given subcutaneously.

During the course of the experiments the urine was examined quantitatively for albumin by Esbach's method, and for glucose with Benedict's reagent. The functional capacity of the kidney was studied by noting the percentage retention of blood urea, as shown by Marshall's method modified by Van Slyke and Cullen, and also by the elimination of phenolsulphonephthalein. The latter functional test was conducted according to the technique of Rowntree and Geraghty. Observations on the acid-base equilibrium of the blood were made according to Marriott's method by ascertaining the alkali reserve of the blood and the tension of alveolar-air carbon dioxide.

The experiments conducted in this investigation confirm the earlier work of Dickson who demonstrated that uranium would produce in some of

the lower animals a chronic kidney injury comparable to certain of the chronic diffuse nephropathies in man. They further show the character and severity of the functional disturbance associated with the various stages of the uranium intoxication. The severity of the acute degenerative changes in the kidney is largely dependent upon the age of the animal. The older animals developed a more rapid and severe type of intoxication than the younger animals. The intoxication is characterized by a reduction in the alkali reserve of the blood and the development of a kidney injury. The injury to the kidney is expressed functionally by the appearance of albumin in the urine, a reduction in the elimination of phenolsulphonephthalein, and a retention of blood urea.

All the animals intoxicated by uranium showed a disturbance in the acid-base equilibrium of the blood, as indicated by a reduction in the alkali reserve and a decrease in the tension of alveolar-air carbon dioxide. The depletion in the alkali reserve developed more rapidly and was more marked early in the experiments in the older animals than in the younger animals. The severity of the intoxication as expressed by the degree of functional disturbance of the kidney paralleled the severity of the disturbance in the acid-base equilibrium of the blood.

From these results the author draws conclusions as follows:

1. Uranium nitrate is relatively more toxic for old animals than for young animals.
2. This relative toxicity is expressed in the old animals not only by a greater functional disturbance of the kidney, but also by inability to repair the kidney injury and re-establish its functional capacity.
3. The intoxication in younger animals is followed by repair of the renal injury and partial restoration of kidney function.
4. In these animals the processes of repair lead to the development of a chronic diffuse type of nephropathy in which the acid-base equilibrium of the blood may be maintained at the point of normality. Renal functional tests indicate the presence of severe kidney injury.

G. E. BEILBY.

#### ROENTGENOLOGY AND RADIUM THERAPY

Davidson, J. M.: *Stereoscopic Radiography*. *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Section Electro-Therap., 1.

Stereoscopic radiography has two aspects: the vision of the observer and the preparation, placing, and viewing of the X-ray plates. As to the first, the observer must possess binocular vision, that is, he must be able to see the two plates and obtain the combined impression. The eyes need not be equally good. In some persons both eyes, though equal, lack coördination. Others, who are able to see ordinary stereoscopic photographs correctly, have difficulty in seeing X-ray pictures in their proper relief.



These facts are important because they explain how it is that many persons do not understand what is meant when reference is made to the vivid relief of the stereoscopic image. To those who can see it properly the importance of the stereoscopic picture is obvious, requiring no special elaboration, and there can be no doubt that the slow progress in this branch of the work is due to the fact that many workers do not realize their limited binocular capacity.

The production of the proper plates need not be complicated by minute details as to the distance and displacement of the tube. For ordinary distances a displacement of 6 centimeters will suffice.

For teaching the principles of stereoscopic practice, Davidson uses two lights, red and green, and a skeleton cone of wire. The wire cone has two shadows. The one in which the wire intercepts the green light appears red because the red light is not intercepted at that point. Similarly, the shadow in the red light appears green. By using spectacles with one red and one green glass these shadows may be seen stereoscopically and all the factors of stereoscopic X-ray practice, both producing and viewing, may be demonstrated at will. More can be learned in a few minutes by practical experiment along these lines than from much reading of theory.

A point of great importance which if not realized may lead to serious error is that during and between the two exposures the most complete immobilization of the parts must be maintained.

An easy and convincing illustration is the making of stereoscopic plates of a hand, with a slight movement of one finger between the exposures. The image of the unmoved fingers will be correct while that of the other will appear bent forward in an incorrect plane. This point is of the greatest importance in examinations of the chest in which dissimilar stages of respiration produce like incorrect results.

That the apparent far and near points of the stereoscopic image are reversed by changing the plates from right to left is explained by Davidson as due to the fact that, in the development of the visual apparatus from infancy, it is discovered that when an object is near it is necessary to converge the eyes to see it, and when it is farther away it is necessary to diverge them. Therefore the convergence and divergence of the eyes become associated respectively with near and distant objects. These principles, which may be easily demonstrated in a line drawing, apply equally to the hundreds of corresponding points in a pair of X-ray plates. D. R. BOWEN.

**Tousey, S.: A Method of X-Ray Localization of Bullets and Other Foreign Bodies.** *Internat. J. Surg.*, 1919, xxxii, 142.

The author's method requires (1) a lead mark fastened to the skin where it is in contact with the plate; (2) facilities for making two exposures with the tube at a measured distance from the plate and displaced a measured distance after the first exposure; and (3) a wire netting laid upon the plate

during the exposure and therefore radiographed upon it or laid upon the finished plate.

The lead mark which is either left fastened to the skin until the time of operation or is replaced by an indelible ink mark, forms a surface guide to the general topography of the foreign body. If the latter is not in contact with the plate, its image will be double and the amount of displacement will be a guide to its distance from the surface which was in contact with the X-ray plate. A printed table shows the distance in inches from the surface to the foreign body corresponding to different displacements and designated as so many meshes of the wire netting. The method is useful not only for projectiles but for other foreign bodies such, for example, as calculi.

ADOLPH HARTUNG.

**George, A. W., and Leonard, R. D.: The Use of the X-Ray in the Study of Multiple Diverticulitis of the Colon.** *Med. Clin. N. Am.*, 1919, ii, 1503.

Beginning with a review of the literature showing that intelligent appreciation of multiple diverticulitis of the colon dates back hardly fifteen years, George and Leonard observe that it now occupies an important place in medical literature and is recognized as a distinct clinical entity by every operating surgeon of large practice.

The cases of the condition are grouped by the authors as congenital and acquired. The acquired group only is considered in this article. Diverticula are true or complete, and false or incomplete. Those of the colon are placed in the latter group as their walls carry only the mucous and serous coats. The suggestion that all were originally true diverticula, the muscular coat having disappeared by atrophy, is held by the authors to be rather improbable. While diverticula of the large bowel are found most commonly in the descending colon and sigmoid, X-ray experience indicates that their occurrence in the ascending and transverse colon is more frequent than has been believed.

Fæcaliths may form in the pouches and the latter may slough, giving rise to free bodies in the abdominal cavity. The mere presence of a diverticulum is not necessarily productive of symptoms; in fact, X-ray evidence without local symptoms is frequent. This being the case, the recognition of inflammatory sequellæ is of the utmost importance.

Secondary changes, which in general are the result of infection through the walls of the diverticula, may be classified as follows: (1) general peritonitis; (2) acute gangrenous inflammation from strangulation of the pedunculated type; (3) chronic proliferative extramucosal inflammation which is the most constant pathologic process, and in which large palpable masses containing the diverticula tend to surround the gut, produce actual obstruction, and lead to the diagnosis of cancer; (4) adhesions involving other organs; (5) perforation, acute or chronic, the latter followed by abscesses or fistulæ to other organs; (6) chronic inflammation of the



mesentery; and (7) the development of cancer in the inflammatory mass.

In McGrath's series of cases of advanced peridiverticulitis 25.9 per cent showed evidence of malignancy.

Men of middle age and over with a tendency to obesity are predisposed to this condition. Frequent sites of diverticula are the points of entry of the blood vessels. In general, herniæ result from pressure within a cavity plus a local weakness of the wall. These conditions are frequent in the sigmoid and here diverticula most commonly occur. Pain is present in a large percentage of cases, usually as the result of secondary changes, and varies with the degree and type of inflammatory change from acute peritonitis to acute obstruction. In about 15 per cent of the cases there is severe abdominal pain. The passage of macroscopical blood is rare, an important point in the differentiation from cancer.

George and Leonard urge routine roentgenographic examination of the abdomen before the ingestion of the opaque meal. This will often disclose shadows that might lead to confusion if mistaken for parts of the opaque meal. Urinary calculi, calcified glands, and sclerosis of iliac arteries all produce shadows which may simulate the contents of diverticula.

The usual opaque meal is two glasses of buttermilk with  $1\frac{1}{2}$  ounces of barium sulphate to each glass. The colon is visualized best twenty-four hours after the meal. As a frequent site of diverticula is near the mesenteric attachment, the shadows may be hidden if only an anteroposterior plate is made. Palpation under the fluoroscopic screen and stereoscopic plates may reveal some of the hidden diverticula.

The pockets may retain barium for a long period and plates made from thirty-six to forty-eight hours after the meal show the diverticula to best advantage. At this time, with the lumen of the colon free from barium, the barium-filled diverticula stand out distinctly.

The barium enema usually will not fill the diverticula but may give valuable information as to secondary changes involving the lumen of the colon. In general, the inflammatory changes from diverticulitis will present a gradually reduced lumen, while in cancer the reduction will be abrupt. Obstruction from cancer is apt to be severe, rapidly progressive, and finally complete. Obstruction from diverticulitis is usually not severe, very slowly progressive, and rarely complete. An intermittent tumor, palpable and fluoroscopically visualized as of the colon, is always peridiverticulitis. A constant tumor mass may be cancer.

Almost pathognomonic of chronic diverticulitis is a peculiar serrated appearance of the bowel, particularly along the descending colon and sigmoid. This may extend over several inches and is associated with more or less narrowing of the lumen. The serrations are small, close together, with rather sharp points, presenting at times a saw-tooth ap-

pearance. They will not be confused with haustral shadows, being too numerous and too small. Moreover, they are constant in shape and position.

Some acute attacks of diverticulitis simulate left-sided appendicitis, but the X-ray examination will demonstrate the normal position of the cæcum and appendix.

It must be borne in mind that the diagnosis of multiple diverticulitis is not made by the X-ray alone, although in some cases it may seem possible. The X-ray evidence must be considered with all the clinical and laboratory findings. This is of particular importance in the differentiation of cancer and multiple diverticulitis.

D. R. BOWEN.

**Schmitz, H.: The Biological and Therapeutic Action and the Clinical Value of Radium and Roentgen Rays.** *Charlotte M. J.*, 1919, lxxix, 161.

The effect of rays upon living cells is both degenerative and destructive. Whether the cells are normal or abnormal, the nearer they approach or remain in an undifferentiated embryonal state the more readily they undergo cytolysis or destruction.

The difference in sensitiveness of cells to the rays depends upon age—the momentary phase of the developmental period in which they happen to be as well as the age of the host—and on the histologic species and the varieties in each of these.

Cells which are in the embryonal and undifferentiated state or have not advanced far beyond this stage of development are destroyed by a dosage of rays which would excite only a simple reaction in the surrounding mature tissues. The more undeveloped the embryonal cells of a malignant tumor, the more sensitive they are to radiation.

An arrest occurs in the growth of a tumor soon after treatment. This is due, first, to serous infiltration, increase in cell-size from enlargement of the nucleus, and obliteration of capillaries from an increase in the size of the endothelial cells, and, second, to degeneration of the cell nucleus. These changes are of a traumatic nature and cause an inflammatory reaction resulting in a lymphocyte and leucocyte infiltration and a proliferation of the stroma.

Abnormal cells are always demonstrable on microscopic examination, but are in a state of degeneration as shown by the absence of mitosis and every known variety of karyolysis, cytolysis and achromatism. It is impossible to say, however, whether these cells are merely dormant or absolutely harmless and dead. Possibly the processes affect the cell nucleus, preventing further mitosis. Such radiumized tissue will not grow when inoculated in mice.

As the therapeutic action of radium is confined to a radius of 4 centimeters, it is purely local. The action of the roentgen rays from a correctly adjusted Coolidge tube is far more intense and diffuse. Radium is used in body cavities, applied directly into or against the tumor mass, and in surface



growths when purely local action is desired. In all other cases the roentgen ray is preferred.

Schmitz closes his article with a tabulation of 283 cases of malignancy treated with radium and the roentgen ray. Pre-operative and postoperative raying with as radical removal as possible is the technique recommended.

D. R. BOWEN.

### MILITARY SURGERY

**Keith, A., and Hall, M.: Bones Showing the Effects of Gunshot Injuries Now in the Army Medical Collection.** *Brit. J. Surg.*, 1919, vi, 537.

This article is based on a study of 467 macerated bone specimens which are all that have been mounted of the specimens forwarded to the museum of the Royal College of Surgeons of England.

Among these are 109 specimens of cranial injury which the authors divide into three main groups: (1) injuries of contusion; (2) injuries due to penetration; and (3) injuries due to through-and-through perforation.

A particularly interesting group among the injuries of contusion are those in which there is no depression or fracture of the external table but a fracture of the internal table. There are only five of these specimens and their rarity is attributed by the writers to the low mortality resulting from this type of injury. In one specimen the fragments of the inner table had been driven deeply into the substance of the brain.

Among the injuries due to penetration a secondary injury was sometimes produced in another part of the cranium. Some of the apertures are clean cut and others are fissured or show the effects of explosive force.

The injuries due to perforation are defined as that type in which the missile passes through two walls of the skull, producing a wound of entrance and a wound of exit.

The effects of explosive force and all gradations of fractures are seen. One specimen shows evidence of explosive force which wrenched the occipital sutures open. A trephining or decompression operation had been done in 26 specimens.

A characteristic fracture following tangential or glancing blows is a fracture with four fissures radiating from the point of origin, two of which diverge upward and two downward.

A study was made also of the specimens which show healing processes. One school has emphasized the importance of the periosteum in bone repair of the cranium, and another the value of cancellous bone. In these specimens the authors traced the separation of dead bone fragments and areas of infected bone by a process of sequestration, but in every case the amount of callus is scanty. In the older specimens, the fragments have been cemented in place by internal callus, and gaping fissures have become filled and obliterated. These points the authors believe show that, at least in the cranial bones, the cancellous bone is the only part

capable of producing callus. In old apertures they found a process of absorption at the margin. These margins have become thinned out and smoothed, but in none of the specimens in the collection was there observed any tendency to bridge over the defect, even after a year's time. G. L. McWHORTER.

**McKenzie, R. T.: The Functional Re-Education of the British Soldier.** *Med. Rec.*, 1919, xcv, 827.

From a very deplorable state the camps for convalescents, increased to sixteen organized camps, each having a capacity of 5,000 patients.

The men in these camps were divided into four classes: Class A, those fit for active service; Class B, those fit for service on lines of communication; Class C, those fit for home work only; and Class D, those still under treatment and unclassified.

Patients with shell shock and nervous troubles were given a neutral bath the temperature of which was about 93 degrees. After this bath they were wrapped in blankets and allowed to rest. The next day they were taken for a slow walk. Arms and legs having scar tissue were bathed in water with a temperature of 112 degrees. Electrotherapy and ionization were also used to some extent. Dry and radiant heat preliminary to massage was found to be beneficial. Apparatus was devised to make the patients use their muscles. As they improved they were put into classes and the exercise increased.

Gassed patients who were merely neurotic were given breathing exercises. When a nerve had been caught up in scar tissue radiant heat afforded greatest relief. In cases of foreign bodies it was often found that massage started up inflammation and assisted in speeding their removal. In the case of patients with deformities of the face, facial masks made of a thin film of copper were of great value.

A test of going through wire entanglements was given the men before they returned to service. This taught them knee raising, balancing, and the estimation of distance. After treatment it was possible to place about 40 per cent of them into Class A.

F. P. HAMMOND.

**Biggar, J. L.: Rehabilitation in Canada.** *Med. Rec.*, 1919, xcv, 821.

In restoring an injured soldier to a gainful occupation, the state should first see that the disabling condition is overcome as much as possible by the best medical and surgical care; that the functions of the injured parts are restored to the utmost; and that artificial appliances are used when they will render the patient more independent.

A Military Hospitals Commission which was established first in Canada was later absorbed by the Department of Soldiers Civil Re-establishment.

Many of those accepted for military service regardless of fitness during the early days of the war have returned for care. The cases of insanity and tuberculosis and the orthopedic cases have been



placed in separate hospitals. Soldiers who would recover in a short time have been kept in military hospitals. Those who will not recover before a longer time are discharged and cared for in a civilian hospital under government control, a plan which relieves them from military discipline and teaches them self-reliance. Ex-soldiers suffering from recurrence of a disease for which they were discharged from the army also receive medical care and an allowance equal to their pay in the army.

Muscle-training apparatus and games of all sorts have been used to restore loss of function. Massage, physiotherapy, and electrotherapy are obtaining more recognition.

Owing to the lack of skilled men to make artificial limbs, disabled soldiers are trained to do this work. In addition to artificial limbs, a special boot, elastic stockings, supporting belts, etc., are provided.

About fifty thousand men have already been discharged with disabilities. Of these it is hard to know how many will return to their previous employment because some of them may be afraid of losing their pensions by showing their ability to work, the employers have needed help so badly that they would take anyone, and the

possibilities and advantages of training are only now becoming known.

About 10 per cent of those disabled will require a course in industrial training. Each applicant is thoroughly examined and his case investigated. Approximately 10 per cent are refused. The training given is of three types: ward training, occupational workshops and class rooms, and the official course known as industrial training.

In determining pensions the candidate's pre-war occupation is not considered and the pension is not reduced because of subsequent success. All disabilities except those from vicious and improper conduct should be pensionable. Another payment is based on the length of service. Land may be procured by soldiers on easy payments and also \$2,500 for material needed.

During the last few years the advantages of preventive measures against disease and the necessity for sanitation have become more evident. Another observation resulting from the war is the extent of nervous disorders among people supposedly in good health. In therapeutics the greatest advance has been made in functional training. Physiotherapy also has made great strides.

F. P. HAMMOND.

# GYNECOLOGY

## UTERUS

**Graves, W. P.: Cancer of the Uterine Body as a Borderline Case in Gynecology.** *Med. Clin. N. Am.*, 1919, ii, 1289.

Graves sums up his conclusions as follows:

1. Cancer of the body of the uterus may be classed as a borderline condition because of the frequency with which it is treated medically by the general practitioner.

2. The slightest show of blood after the menopause should demand an immediate curettement of the uterus for microscopic examination of the endometrium even though bimanual examination reveals nothing abnormal.

3. Cancer of the uterus, both of the fundus and the cervix, often causes a water discharge which simulates urine. Such a discharge from the vagina is therefore a signal of danger.

4. Cancer of the uterine body is operable long after its initial symptoms. It is the most favorable for operation of all deep cancers because of its slow growth, late metastasis, and long confinement to a group of organs that can be removed easily.

5. Cancer of the uterine body may occur in the menopause decade and resemble in its symptoms uterine insufficiency.

6. The menopause is characterized normally by a lessened flow of blood. An increase of blood at that time is an important danger signal.

7. An increase in the flow of blood near the menopause should always be investigated by microscopic examination of the curetted endometrium even if digital examination reveals no anatomical abnormality.

8. Radium is almost specific for controlling hæmorrhages of uterine insufficiency.

L. R. GOLDSMITH.

**Bordarampé, J.: Uterine Epithelioma Treated with Benzol** (Tratamiento del epitelioma del útero por el benzol). *Rev. Asoc. méd. argent.*, 1919, xxx, 237.

In a few cases of histologically diagnosed uterine cervical epithelioma the author has obtained excellent results from the use of benzol. There is no sign of further progress of the disease and the patients' weight has progressively increased.

The treatment is simple. A tampon wet with pure benzol is left in contact with the neoplasm for five minutes and then replaced by a dry sterile tampon. Two lavages of 2 liters of warm water to which 50 drops of benzol has been added are given daily, the liquid being kept constantly stirred.

Fætidness, secretions, and pain disappear and there is a slow and gradual destruction of the tu-

mor followed by epidermization. The weight increases about 1 kilogram per week.

While the cases treated are few and the time which has elapsed since the treatment is short, the author feels that this method, which he believes he originated, deserves to be brought into notice. For a number of years he has made a study also of the effects of benzol on normal and neoplastic tissues other than cancer and is satisfied that while it destroys neoplasms it does not harm normal tissues.

W. A. BRENNAN.

**Little, J. W.: Radium in the Treatment of Uterine Fibroids.** *J.-Lancet*, 1919, xxxix, 219.

This is a report of 77 cases of uterine fibroids. Sixty of these were treated with radium and there were no deaths in the series.

As yet the methods of employing radium have not been standardized, the amount to be used and the length of time it should be applied being based on individual experience. The important facts for a beginner to remember are that radium is a very powerful agent and that it is much better to use a little than too much.

Hæmorrhage from fibroids of the uterus is quickly and effectively stopped by the introduction of 50 to 100 milligrams of radium in tubes placed in an ordinary rubber catheter and inserted into the uterus where it should be allowed to remain from two to twenty-four hours, depending upon the indications. A little gas anæsthesia may be needed for its introduction.

The patients in the series reported remained in the hospital one or two days, after which they went about their usual duties. With most patients one application was sufficient, but a few required two or three treatments. The tumors usually disappeared gradually. Large fibroids causing pressure symptoms and those suspected of malignant degeneration were removed. If the uterus was soft or there was a rapidly growing tumor, the number of milligram hours of radium treatment was reduced, the reason being that the newly formed cells if broken down too rapidly might produce a dangerous toxæmia.

The usual operative complications, such as pain, morbidity, thrombosis, and pulmonary embolism, are avoided by radium, and there are no contraindications to its use in debilitating conditions such as diabetes, nephritis, and anæmia. Its action depends upon the production of endarteritis and upon cauterization of the endometrium.

The ages of the patients in the author's series varied from 33 to 73 years; the amount of radium used, from 50 to 90 milligrams; and the time of application from 3 to 26 hours, depending on the condition and the number of treatments received. The



largest number of milligram hours received by one patient was 6,120, this being the aggregate of three applications.

C. D. HAUCH.

### EXTERNAL GENITALIA

**Gallagher, J. F.: Syphilitic Induration of the Vulva; With Report of Four Cases.** *Surg., Gynec. & Obst.*, 1919, xxviii, 482.

The term "elephantiasis" has been applied to a large group of cases of chronic enlargement of a part, with or without ulceration, and microscopically characterized by increased connective-tissue formation with lymphatic dilatation. Huguier applied the term "esthiomène" to this condition when it involved the vulvo-anal region, and in such cases Hyde, Taylor and Kurz believed it to be a manifestation of tertiary syphilis. For both of these, the author substitutes the term "chronic syphilitic induration of the vulva." Microscopically, syphilis and tuberculosis may be confusing.

**CASE 1.** The patient was a mulatto laundress, 30 years of age. Her mother was living and well; also one sister. Her father and one sister had died of an unknown cause. The patient used tobacco and alcohol. She had had no illness of importance, but had suffered from hæmorrhoids all her life. Occasionally she had pain on defecation and had passed blood and mucus in the stools. There had been also several attacks of nocturia and burning on urination, but no hæmaturia. Her menses were normal. Ten years previously she had a miscarriage at four months, followed by an uneventful recovery. A venereal history was denied. Four years previously she noticed in the region of the clitoris a growth about the size of the thumb which had increased in size steadily to the time of the examination. About eight months previously a growth had been noticed about the anus which was associated with a burning sensation but no ulceration. The physical examination revealed enlargement of the tonsils, and there was a loud systolic murmur. The inguinal lymph glands were palpable. In the region of the clitoris and involving both nymphæ was a pedunculated tumor measuring 12 by 15 centimeters, and on the right side of this tumor an erosion 2 by 4 centimeters, in size. The labia majora were very much thickened and hard like pigskin. Covering the entire perineum and extending back to, and including, the anus, was a large cauliflower-like red growth with a very slight discharge. The urinary meatus and vaginal walls were normal. The Wassermann test was 4+.

**CASE 2** was that of an unmarried negro domestic, 19 years of age. Her family history was negative and she herself had never had any illness of importance. In the past year she had lost 30 pounds in weight. For the last three months she had had leucorrhœa. Her menstrual periods had been normal except that the last one was missed. She had had no children, miscarriages, or abortions. On the hard palate was an ulceration the size of a dime. Eighteen months previously she noticed a small nodule on the

left side of the vulva, and later a similar swelling on the opposite side. Both were hard and had continued to grow up to the time of examination. At night they were painful. The inguinal glands were palpable. On the left labium was a rather soft, fluctuant, not tender tumor, 6 by 8 by 12 centimeters in size, and on the right, a similar tumor measuring 4 by 5 by 7 centimeters. Between the two masses, covering the labia minora and the vestibule and extending to the perineum, was an ulcerated area with a foul-smelling discharge. The urine, blood and Wassermann tests were negative.

**CASE 3.** The patient was a mulatto housewife, aged 32. Her family and personal history were negative. Thirteen years previously she had had typhoid (?) fever for one year and was sick two years. Since then she had been unable to walk on account of contractures of the flexors of the toes and the calf muscles. She had not had any children, miscarriages or abortions. For fifteen years she had had leucorrhœa. She denied venereal infection. She had not lost weight. Two years previously she noticed an enlargement on the upper part of the external genitals. Six months later ulceration developed beneath the tumor. She had pains of a burning character which were worse at night, and was poorly nourished. The inguinal lymph glands were palpable. The lower limbs were small from disuse. Knee jerks were absent. Growing from the region of the clitoris was a tumor 5 by 7 by 10 centimeters in size. Two smaller growths projected from the lower edge toward the vagina. Involving the entire perineum and extending out to the inguinal folds was an ulcerated area with elevated, undermined edges. The Wassermann test was 5+; the urine negative.

**CASE 4.** The patient, an unmarried negro nurse, aged 19 years, had a negative family history except that her father and one aunt had died of heart disease. She complained of nocturia, but denied venereal infection. Her menstrual history was negative though she had not menstruated in the last three months. She had not had any children, miscarriages or abortions. For three and a half years she had had leucorrhœa. About one month after the beginning of the vaginal discharge, a severe itching of the vulva began and was followed by a sore which she believed was due to scratching. This sore persisted and in about one year she noticed a swelling on the right side of the vulva. During the past three months there had been a similar swelling on the left side. Between the two tumors was an enlarged ulcer which had grown from the first tumor. On examination the patient appeared older than her age. She had some oedema of the eye-lids, her pupils did not react to light or accommodation, and there was an external squint in the left eye and nystagmus. The front teeth were markedly deformed. There was generalized lymphadenopathy. The reflexes were present but sluggish. In the right labium was a tumor 4 by 6 by 10 centimeters in size, in the left a second growth about half as large, and in the region of the clitoris a third measuring 3 by 3 by 4 centi-

meters. Beneath the tumors, extending out on the thighs and back around the anus, was an ulcerated area with elevated edges. This ulcer extended also into the posterior wall of the vagina. About 1 inch inside the vagina was a constriction which admitted only the index finger. The blood showed a leucocytosis of 12,000 and a 4+ Wassermann.

On removal all tumors were found to be vascular and to have a pearly white base which exuded serum on pressure. There was a thickening of the surface epithelium and perivascular infiltration. Giant cells were present, but no caseous masses. One tumor contained demonstrable *spirochætæ pallidæ*.

The treatment consisted in the removal of the growths and a plastic covering of the denuded areas followed by vigorous anti-syphilis treatment.

C. D. HOLMES.

### MISCELLANEOUS

**Bandler, S. W.: Sterility in Women, with Special Reference to Endocrine Treatment of Same.**  
*Med. Clin. N. Am.*, 1919, ii, 921.

The first thirteen pages of this article review the various phases of sexual development and the part played by the internal secretions. The author discusses the causes (internal secretions) of dementia præcox, postpartum mania, menstruation, amenorrhœa during pregnancy, the ability to resist disease, the bad effect of the recent influenza epidemic on pregnant women, the phenomena of labor,

the causes of repeated miscarriages, and the menopause. He comments also on the use of pituitrin during labor, the recent increased surgical trend of obstetrics, and the decreased surgical trend of gynecology.

He then comes to the subject of the causes of sterility in women, discussing the importance of each. The causes considered include retroflexion and inflammation—he urges against the use of the curette in this latter case and in fact in most cases—and cervical obstruction. He suggests that in looking for the cause of sterility it is well to determine the following points: Are ripened ova given off or are the ovaries cystic (he describes an operation which he uses to correct the latter fault); do ova reach the uterus or are the tubes closed; if the ova reach the uterus do they fail to attach themselves even though impregnated? He suggests also that frequently the fault is not the woman's and that it is well to determine whether live spermatozoa are present in the husband's seminal fluid.

He reviews the beneficial results of the use of endocrine therapy in a number of his cases and tells what extract and how much of it he administers. Endocrine therapy may be of value also in treating men.

Psychoses and neuroses due to glandular anomalies may be inherited and there are varying degrees of these diseases as there are varying degrees of bodily ailments due to anomalies of internal secretion.

C. M. GRUBER.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Ahlström, E.: Concerning the Premature Separation of the Normally Implanted Placenta (Ueber vorzeitige Lösung der normal sitzenden Placenta: Retroplacentare Blutung). *Nord. med. Ark.*, 1919, li, Ark. f. Kir., 423.

The author's material consisted of 82 cases of premature separation of the normally implanted placenta.

### **PATHOLOGIC ANATOMY**

In premature separation of the normally implanted placenta not followed by immediate labor there is compression of the separated part by the blood clot. According to Meyer, the loosened area has the appearance of a croupous pneumonic lung. If only a small area is loosened, pregnancy goes on, at least for a time. We find then the picture of a well-organized blood clot, dark red in color, frequently arranged in layers, covered on the uterine side with decidua and on the fetal side with a grayish, compact capsule several millimeters in thickness consisting of compressed necrotic placental tissue.

The compression may be so severe that the covering is as thin as paper. Small hæmatomata may be accompanied by very mild or no symptoms at all. Because the surface of the coagulum is on the same level as the maternal surface of the remaining portion of the placenta, these areas are frequently looked upon as infiltrated cotyledons. The author's material contained 11 cases which showed coagula no larger than a hen's egg. If, however, larger areas are separated, labor sets in immediately and compression is rarely severe enough to produce the groove or depression in which the hæmatoma forms. The literature shows many cases in which the compression has lasted for a longer period of time, but it is remarkable how few descriptions of more recent cases can be found.

Young describes as the earliest change within the loosened area a marked congestion. Microscopic examination shows congestion of the villi which are packed closely together, the intervillous spaces being empty or filled with fibrin deposits. The microscopic picture is similar to that of red infarct and was mistaken for that by Young. The author found this marked congestion in two early cases in which it was possible to examine the tissue microscopically. The other cases may have shown it, but as no microscopic examination was made it cannot be excluded although the macroscopic appearance did not suggest it.

Ahlström inclines to the view of Young that the cause of the collapse of the intervillous spaces is the shutting off of the arterial circulation due to the

separation of the placenta, the blood being rapidly taken up by the open veins aided by the pressure exerted by the blood clot.

### **LOCALIZATION**

In the author's material there were 19 cases of peripheral separation. As in several there were multiple areas, the total number of peripheral separations was 24. Of these, 7 involved from one-third to over one-half of the placenta and therefore possibly might have been central in origin. In 15 the separation was central, i.e., it did not reach the edge of the placenta.

Several authors emphasize the occurrence of hæmorrhages or apoplexies within the placenta (also called red infarcts) which are generally accompanied by retroplacental hæmatomata. If they occur in numbers, they give the placenta the appearance called by Pinard and Rouhaud "placenta truffe," and according to these authors and others are due to albuminuria.

The diffuse blood suffusions first described by Jaquemier, large congested areas in which the villi are separated by coagula, are also supposed to be rather frequently associated with premature separation. The author, however, found none in 13 cases in which he examined the placenta.

Hartman has shown that small hæmatomata within the decidua on the surface of the placenta are much more frequent than hitherto believed. He found 30 such hæmatomata in 500 placentæ, their size varying from that of a small pin head to the size of a two-penny piece. At times they were situated on the surface, and at others within the substance of the decidua. Like the large hæmatomata, they were never in communication with the intervillous spaces. Six such hæmatomata were present also in 67 cases of premature separation.

The occurrence of retro- and intraplacental hæmatomata without any communication with the intervillous spaces cannot be explained in any way except by the assumption that the hæmorrhage originated in the decidua and the blood was therefore from the maternal circulation. Hartman further holds that the small hæmatomata are the beginning causes of the placental separation. In this the author agrees completely although several exceptions to the rule have been observed.

### **ETIOLOGY**

These retroplacental hæmorrhages have been explained as due to degenerative changes in the decidua or inflammatory changes. The author's investigations, however, seem to show that degeneration or necrosis in the decidua is of very little importance in the premature separation of the



normally implanted placenta. His anatomical studies further indicate that inflammatory changes in the decidua are not a factor in the premature separation. Moreover, the clinical analysis of his material does not show that endometritis plays any rôle in its production.

During the past few years attention has been called to the occurrence of hæmorrhagic infiltration of the wall of the uterus in cases of premature separation of the placenta. Infiltrated blood is found in the connective tissue between the muscle bundles and only rarely within them. An associated œdema is also occasionally described. Williams found changes in the blood-vessels, endarteritis of the smaller vessels, and fresh thrombi in the smallest vessels and occasionally in larger vessels. Couvelaire demonstrated bursting of certain venous sinuses but no vessel change. Essen-Møller and the author also have been unable to demonstrate changes in the vessels.

The infiltration may extend through the entire thickness of the wall of the uterus. This occurred in 10 out of 24 cases. Occasionally it may be confined to the placental site. Frequently it extends to the serosa and gives the uterus a peculiar appearance, smaller or larger areas of stripes or confluent areas of bluish-red color. Ruptures through the serosa may occur and lead to severe internal hæmorrhage. In addition to this uterine infiltration, there is occasionally an associated infiltration of the broad ligaments.

Bar, Essen-Møller, and Williams hold that hæmorrhagic infiltration is usually but not constantly associated with premature separation of the normally implanted placenta and that this group is due to, and characteristic of, the pre-eclamptic state. Whether this is true or not is difficult to prove as opportunities during laparotomy and section are relatively rare. The author found this intramural bleeding in 3 out of 4 cases in which section offered an opportunity to observe the condition. He discusses its etiology in his consideration of intoxication as a cause of premature separation.

Special interest was taken by Ahlström in the examination of the placenta and uterus to determine whether from these local changes a common etiological factor could be established. This, however, was not possible. His own investigations as well as those of others have shown that while local changes which have been recently described also by numerous other authors do occur in certain cases they are not constant and do not occur in the majority of cases. It is possible that in certain instances they may be contributory factors.

The clinical study of the material has led to the conclusion that the cause must be sought partly in a mechanical factor exerted upon the uterus or fœtus and partly in more directly acting diseases of the mother. Among mechanical factors traumata come first. These, however, were soon realized to be of minor importance—2 to 3 per cent—though un-

doubtedly they are important factors in a small number of cases. Meyers believes that a trauma may initiate a severe uterine contraction, even hæmorrhage into the decidua. Seitz, however, believes that by suddenly increasing the hydraulic pressure trauma may cause a bursting. Through the sudden distention of the uterine wall, small or large areas of placenta may become loosened and hæmorrhage result.

According to Spiegelberg, psychic traumata may produce a partial contraction of the placental area.

Traction on the cord was formerly held to be of much importance. This, of course, can occur only during the expulsive stage or in other rare instances. Essen-Møller, however, found that traction on the cord will produce rupture before the placenta loosens.

Sudden evacuation of large amounts of amniotic fluid may cause a premature separation due to the suddenly diminished area of the placental site or sudden rushing of blood to the decidual vessels and their rupture.

In a few cases overfilling of the venous circulation has been advanced as a cause. Sudden straining, severe coughing, heavy lifting, etc., have been mentioned; also diseases producing venous congestion. However, care is necessary in interpreting such cases as these may be only exciting incidents whereas the fundamental cause may be overlooked.

The causes mentioned take care of only a very small number of cases and not much etiological significance may be attached to them. In all probability they are merely coincidences and in only a few cases the exciting factors.

Considerable importance must be attached to the frequent association of albuminuria, nephritis, eclampsia, and premature separation. Albumin was present in 57 of the author's 80 cases (71 per cent). In 31 cases (39 per cent) examination of the urine showed at least 1 per cent of albumin—the arbitrary differentiation point between the albuminuria of pregnancy and nephritis. This incidence of 71 per cent is contrasted with an incidence of 24 per cent among 3,002 patients delivered at the clinic in 1915. It shows how much more frequent albuminuria is in cases of premature separation. Thirty-nine per cent of the patients had over 1 per cent of albumin and in 24 per cent nephritis could be diagnosed positively whereas in the general run of cases as typified by the 3,002 cases of 1915 the corresponding figures were only 4.4 per cent and 3 per cent respectively. Essen-Møller's figure for albuminuria in premature separation, 58 per cent, is also high.

Considerable difference of opinion exists as to the part toxæmia plays in the production of premature separation. Many, however, believe that it is the most important factor. In the opinion of the author and others, premature separation, albuminuria, the nephritis of pregnancy, and eclampsia are all consequences of the same pathologic picture, i.e., intoxication. Like the hæmorrhages into the



organs (liver, spleen, kidneys, and brain) which are common in eclampsia, the diffuse hæmorrhages or infiltrations into the uterine muscle, decidua, etc., are results of the same intoxication causing premature separation. The effect is brought about not only by an increased permeability of the spongiosa vessels but also by the increased blood pressure incident to the intoxication.

It cannot be denied that many objections may be raised against the intoxication theory, particularly the objection that if the theory is true premature separation of the placenta would occur more often in the most severe form of intoxication, i.e., eclampsia, whereas this is not the case. Furthermore, premature separation with even external hæmorrhage has been observed frequently in the early months of pregnancy when intoxication and eclampsia are extremely rare.

From the author's exposition of the etiology of premature separation it is readily seen that the question is not definitely solved. His conclusions may be summarized as follows:

1. Direct traumata may cause premature separation, but are not a frequent cause.
2. Although proven in only a few cases, it is probable that lues is of etiological significance, presumably by causing changes in the blood-vessels.
3. It is not probable that local changes in the decidua, degeneration, or inflammatory changes are of any importance.
4. Many facts indicate that the intoxication of pregnancy which is the cause of albuminuria, nephritis, the pre-eclamptic state, and eclampsia, is also of much importance in the production of premature separation. Von Frankl's view that every factor causing abnormal hyperæmia, abnormal blood pressure in the spongiosa vessels, may lead to hæmorrhage and that the intoxication causing albuminuria, nephritis, and eclampsia with increased blood pressure and perhaps associated blood-vessel change also causes the premature separation is very probably correct. It is probable also that other factors such as severe trauma, psychic trauma, rapid emptying of the uterus, especially in hydramnion or twin pregnancy, and cardiac incompetence, by causing an abnormal hyperæmia or an increase in blood pressure, may be at least contributory.

#### SYMPTOMS AND COURSE

According to DeLee, accidental hæmorrhage which usually occurs at term, may set in at any time during the last twelve weeks. In the author's series there were 18 cases before the last three months, among them 2 of the most severe during the sixth month.

Retroplacental hæmorrhages without symptoms are frequently overlooked unless a thorough examination of the placenta is made. They are undoubtedly more frequent than reported. Small areas no larger than a hen's egg are separated and frequently give rise to premature labor. Usually, however, some time elapses before labor sets in as is shown by

the changes in the separated area and in the blood clot. In general, fetal movements cease some time afterward and the child often dies—10 out of 11 of the author series—although perhaps some of these deaths were due to the associated albuminuria. After delivery, evidence of a premature separation is often seen, such as the passing of old blood and the immediate delivery of the placenta with old coagula.

Meyer states that whenever a separation of the placenta occurs, labor follows immediately, and this seems to be the common belief. There have been, however, cases of extensive separation in which it did not begin until several days later. The author had 16 cases in which labor set in some time after the separation as shown by the hæmorrhages. In the author's remaining 55 cases labor followed the onset of the symptoms of separation almost immediately.

Usually the symptoms begin just before the onset of labor pains. This and the fact that only 28 of the patients belonging to the group went to term, confirm the view that we are dealing with a complication of pregnancy. Also in the cases in which symptoms of separation set in after the onset of labor pains, it seems probable that the separation was primary and the cause of the onset of labor. Further proof of this is seen in the fact that many of the patients of this group did not go to the calculated time but were delivered earlier.

Cases in which the symptoms set in late during labor or toward the end of the first stage of labor are a little different. In these the separation must be looked upon as a complication of labor rather than of pregnancy. This is further corroborated by the fact that most of these cases occurred at term, although small areas of separation may have taken place without symptoms during the course of the pregnancy.

Clinically the cases may be divided into two large groups: (1) those with distinct symptoms of internal intra-uterine hæmorrhage, and (2) those without such symptoms.

The first group comprises practically all the severe cases. All authors are agreed that a patient rarely shows symptoms of intra-uterine bleeding which remains occult, that sooner or later the hæmorrhage appears externally. The author had 21 patients who showed distinct symptoms of internal intra-uterine hæmorrhage and in only one case the hæmorrhage remained occult during labor. In 8 of the 21 it remained concealed from one to fifteen hours and most of these were severe cases.

Well-developed intra-uterine bleeding shows the classical picture of premature separation. Frequently the patient who was previously well or had a history of albuminuria during pregnancy or an occasional hæmorrhage, is seized with severe pain in the abdomen. The uterus becomes distended and tense, constantly contracted, hard and sensitive, the heart tones disappear suddenly, and in a short time there are definite signs of anæmia.



If external hæmorrhage occurs, it is frequently out of proportion to the anæmia, and not rarely the picture of shock supervenes. Pinard stated that pain is rare. The author, however, found it a very common symptom. The pain probably is due to the stretching of the peritoneal covering of the uterus as a result of the tension. This may be so great that even rupture of the muscle and serosa may occur. The pain diminishes or disappears entirely after a copious external hæmorrhage. Distention of the uterus beyond its normal size is also a very common symptom. In certain cases the retroplacental hæmatoma may cause a bulging of the uterus on that side, the accessory tumor of Holmes. A very common and important symptom is the tenseness of the uterus which is constantly contracted and more or less sensitive. A change of consistency which made palpation of the child impossible occurred in 16 of 21 cases of uterine hæmorrhage.

Heart tones as a rule disappear simultaneously with the onset of the symptoms of internal hæmorrhage or soon afterward. Spaeth who saved the lives of 2 children by immediate cesarean section emphasizes the point, however, that separation occurs gradually and the chances for saving the child are good if action is immediate. The author's material does not substantiate this. Among the cases of internal hæmorrhage, the hæmorrhage occurred in 18 before the patient was brought to the hospital. Heart tones were already absent in 14, and present in 4. Of these 4, two premature children died; in one case the patient was admitted to the hospital one hour after the onset of symptoms, two hours after the heart tones disappeared, and the full-term child was born dead. In only one case was a living child born. Therefore, it will be seen that in 21 cases of internal hæmorrhage only one child was born alive and there was only one case in which an immediate section might have saved the child's life.

The disproportion between the anæmia and the external hæmorrhage or the absence of external hæmorrhage is one of the most important symptoms. The poor general condition of the patient is not due to the anæmia alone, but also to the shock, the peritoneal irritation, and the existing intoxication of pregnancy. The external hæmorrhage is no indication of the severity of the case. Some patients may have only a serosanguinous discharge due to the coagulation of the blood with expression of the serum. This is held by some authorities to be almost pathognomonic. Labor pains as a rule are poor or entirely absent because of the distention of the uterus and the intramuscular hæmorrhages.

During delivery there is frequently a simultaneous expulsion of a large blood clot or a large quantity of fresh blood. Especially in the larger separations, the placenta is often expelled immediately after the baby. More rarely, atony of the uterus after delivery leads to severe or even fatal hæmorrhage. In the author's 21 cases of internal hæmorrhage, 4 patients had atonic postpartum bleeding.

In 2 instances they were fatal, and in one, manual delivery of the placenta led to sepsis and death.

In the second large group of cases, called by the author cases of "external hæmorrhage" the characteristic symptoms of internal hæmorrhage are absent and the most important symptom is an external hæmorrhage of variable degree. The author's material comprised 39 cases, but he believes that a thorough examination of the placenta in every instance would reveal a much larger number than hitherto reported.

Hofmeier emphasizes the point that frequently the hæmorrhage does not set in until the second stage of labor, and that if it begins earlier, it continues after the rupture of the membranes. A disappearance or weakening of heart tones also occurs quite frequently in this group of cases; in certain instances followed directly by delivery it is the only symptom. The placenta also is discharged almost at once after delivery of the child, and blood clots, old or fresh, follow. Atonic postpartum hæmorrhages are not so common and in no instance were they serious among the author's cases.

The question whether the non-rupture of the bag of waters aids in checking an internal hæmorrhage or keeps it from becoming worse has been repeatedly discussed. Winter, Hofmeier, and Engstrom do not believe it does. In the author's 21 cases there was an aggravation of symptoms in 9 in spite of non-rupture of the membrane. Three of these patients died. In 8 cases in which the membranes remained intact no aggravation of symptoms occurred. The author believes that the presence of the bag of waters does not prevent an internal hæmorrhage. The incidence of the labor pains seems to play an important rôle here.

Ahlström also concludes that symptoms of internal hæmorrhage are not more frequent in cases of central separations, as is held by some authors. Goodell, Holmes, and others attribute the fact that the hæmorrhage may remain internal to the closure of the tract by some advancing part of the child. Several of the author's cases confirm this. Hartman emphasizes the point that the site of the placenta may have considerable bearing upon the amount of external hæmorrhage and points to a case in which the placenta could be palpated 5 to 6 centimeters from the internal os. The author shows, however, that even when the placenta is situated low, the characteristic clinical picture of premature separation as well as the placental changes result. He describes 6 cases in which the placenta was palpated very low down.

#### DIAGNOSIS

Any case of internal hæmorrhage in which there is a history of albuminuria and acute pain in the abdomen, sensitiveness of the uterus, increased volume of the uterus, tenseness of the uterus accompanied by persistent contraction of the organ, disproportion of the external hæmorrhage to the amount of anæmia, and disappearance of the heart tones, speaks for premature separation. Placenta prævia with external hæmorrhage must be differentiated, but inability to palpate the placenta excludes this with certainty.



Uterine rupture is rare during pregnancy, occurring as a rule after prolonged labor. The general symptoms may be the same, but palpation of the child outside of the uterus and internal palpation without feeling any part of the child, lead to the correct diagnosis. Hydramnion may simulate the condition but is slower in development and there is no external hæmorrhage. An acute surgical abdomen may also be confusing, but here the pain and tenderness are usually confined not to the uterus but to some other part of the abdomen. Furthermore, the temperature and a disturbance of bowel function will aid in arriving at the correct diagnosis. Moreover, anæmia is not present except in cases of rupture of an extra-uterine pregnancy.

If no symptoms of internal hæmorrhage are present only placenta prævia need be differentiated. Unless the cervix is closed, a placenta prævia is easily palpated. A placenta which is implanted low, however, cannot always be excluded and it may be necessary to observe the changes in the placenta after its delivery to make the correct diagnosis. Rupture of the sinus circularis, although rare, cannot be diagnosed with any degree of certainty, and neither can rupture of velamentously inserted cord vessels.

#### TREATMENT

The author has previously called attention to the rarity with which cases of premature separation with symptoms of internal hæmorrhage and unprepared soft parts are obtained for treatment while the child is still alive so that immediate, either vaginal or abdominal, cesarean section may save both it and the mother. It is evident that a slight hæmorrhage during the later stage of labor is of considerable importance and the heart tones should be watched most carefully in order that an immediate extraction may be done. Except in such cases the child need not be considered. All authors are agreed that cases terminating spontaneously are fairly common, due to the fact that the condition is being recognized also in the milder cases. Of the author's 62 cases in which symptoms occurred during labor, 31 in which nothing was done terminated spontaneously. However, when dealing with cases in which the symptoms are urgent, there are considerable differences of opinion regarding the action which should be taken.

Tamponade is one of the oldest methods of treatment. Coclough of the Rotunda treated 43 cases with tamponade and in 42 the hæmorrhage ceased. Six of the 82 patients died and of these 2 were treated with tamponade. This was the only method of treatment when the membranes were intact. In addition, a firm binder was applied above the fundus to press the uterus against the tampon. De Lee uses a similar procedure. After rupturing the membranes and introducing a colpeurynter into the uterus, ergot and pituitrin are given, and when the dilatation is considered sufficient, manual dilatation or cervical incision is followed by extraction. The principal objection to tamponade is of course infection, and for the same reason it is objected to in other conditions.

Opinions differ also in regard to artificial rupture of the membranes. Most authors favor it. Rupture permits the uterus to contract and stimulates pains which are desirable. Meyer advocates rupture because in most instances bleeding ceases. In 51 cases Levy-Pinard had 28 which terminated spontaneously, and of the 23 in which interference of some kind was necessary, rupture of the membranes was sufficient in 16. The author had 14 cases in which the membranes were ruptured artificially and in 11 the result was favorable. In 3, the symptoms were not improved, a fact which showed that in severe cases rupture alone is not sufficient.

His conclusions are: the retention of the bag of waters intact does not check or prevent a hæmorrhage due to separation. No ill effect due to the rupture is observed, and the stimulation of labor pains by rupture frequently hastens delivery. In severe cases, however, rupture alone is not sufficient. When the condition of the mother is already serious and demands immediate evacuation of the uterus, rupture alone should not be employed. In milder cases rupture of the bag of waters should be followed by an injection of pituitrin, and if this is not sufficient, more effective means must be employed. In a minority of cases still other methods must be used and as a rule immediate evacuation of the uterus is necessary. The method to follow depends upon the condition of the mother, the seriousness of the symptoms, the condition of the cervix, and the resources at hand for the physician. The easiest cases, of course, are those in which the os is completely effaced and dilated or nearly so. In such cases immediate forceps delivery or version and extraction is done, depending on whether the head is fixed or not. A rapid delivery may also be indicated for the welfare of the child.

If the cervix is effaced and thinned out but not sufficiently for delivery, it may be incised three or four times. The cases in which the cervix is neither effaced or dilated and the symptoms do not improve after the rupture of the membranes are difficult. In such instances it is necessary to empty the uterus as quickly as possible with the least amount of risk for the mother and in this way control the hæmorrhage. Metreuryesis, bimanual dilatation, or dilatation with the Bossi dilator may be employed. The first is the safer method and as a palliative measure may be used until a vaginal cesarean or cervical incision can be done later. When immediate action is imperative, abdominal section offers the best chance to save the life of the child. At the same time it affords an opportunity to examine the uterus and to determine whether tears are present, whether it possesses contractility, etc. If necessary, it may be extirpated.

The author believes that abdominal cesarean section is the method of choice in cases of severe or rapidly developing anæmia when the cervix is not prepared or not sufficiently prepared. In doubtful cases the indication for abdominal section may be extended somewhat, rather than limited, especially in the cases of primiparæ.



In atonic postpartum hæmorrhage, uterine tamponade has proved inefficient in many instances, and if the usual methods of control—hot irrigations, compression of the aorta, the Momberg bandage, ergot—fail, extirpation of the uterus should be done as the uterine muscle undoubtedly cannot contract. After cessation of the hæmorrhage, stimulants, salt-solution infusions, direct blood infusions, etc., are of course indicated here as elsewhere.

Former statistics show a mortality of 50 to 62.5 per cent, proof that only the severe cases of internal hæmorrhage were counted. In the author's cases the mortality was 6 per cent or, if only the severe cases are counted, 5 out of 21 (24 per cent). The prognosis for the child is poor. Fifty-eight (70 per cent) of the babies in the author's cases died; of these 30 weighed less than 2,000 grammes. Nine children were alive at delivery but not viable—a total of 67 out of 82 (81 per cent). In 21 cases of internal hæmorrhage 19 babies were born dead. Other authors report similar high mortalities.

L. A. JUHNKE.

**Gonnet, C.: A Case of Extramembraneous Pregnancy** (Un cas de grossesse extra-membraneuse). *Rev. mens. de gynéc., d'obst., et de pédiat.*, 1919, xl, 91.

Gonnet states that only 40 cases of extramembraneous pregnancy are recorded in medical literature. He reports the case of a para-III, aged 29 years, who came to the hospital in the seventh month of pregnancy with the diagnosis of placenta prævia. The fœtus was presented by the breech. Continuous hydrorrhœa or hydrohæmatorrhœa made it very difficult to decide between a diagnosis of decidual hydrorrhœa with endometritis or an amniotic hydrorrhœa with an extramembraneous fœtus. The woman came to labor within a few weeks, a fœtus of 1,450 grams being expelled by the breech. The child, which was normally formed, died within three hours of birth. The placenta was normal and inserted marginally. The membraneous sac was quite reduced compared to the volume of the fœtus. Near its orifice it was rigid and cicatricial and had evidently ruptured many weeks before. The two membranes, amniotic and chorionic, had both ruptured at the same time and the fœtus had continued to live outside of them.

The points to which the author directs attention are: (1) the notable volume of the fœtus, 1,450 grams; (2) the absence of any malformation; and (3) the confusion of the condition before labor with placenta prævia.

In extramembraneous pregnancy the diagnosis depends upon the presence of both hydrorrhœa and hæmatorrhœa.

W. A. BRENNAN.

**Farmer, G.: A Case of Myomectomy during Pregnancy.** *Med. J. Australia*, 1919, i, 384.

Mrs. I., a primipara, aged 31, who had been pregnant for three months, complained of intense pain in the right iliac region with constipation which had continued for about fourteen months.

On external palpation there was felt in the right iliac region an elastic tumor the definition and characteristics of which were obscured owing to the extreme tenderness. On vaginal examination the fundus uteri could be felt pushed to the left and well above the pelvic brim. Through the right fornix a tumor was palpated which caused great pain on manipulation.

The abdomen was opened. The tumor was easily delivered through the wound and proved to be a non-pedunculated myoma growing from the anterior surface of the right cornu of the uterus. There were no adhesions. The condition of the uterus showed that the patient had been pregnant fully three months. The peritoneum was incised around the tumor 3.75 centimeters from the base, and a cuff carefully stripped away. The whole mass was then easily shelled out with a blunt dissector. A fairly deep crater was left, but the uterine cavity was not encroached upon. The muscular walls were closed by mattress sutures and the peritoneal cuff inverted. The growth removed weighed 425 grams. The patient made a perfect recovery and pregnancy continued. Labor was induced at the end of the seventh month. The patient was delivered of a healthy boy weighing 3,300 grams. The puerperium was normal and there has been no trouble since.

F. H. HARMS.

## LABOR AND ITS COMPLICATIONS

**Schwaab: The Use of Pituitary Extract in Obstetrics** (Emploi de l'extrait d'hypophyse en obstétrique). *Presse méd.*, Par., 1919, xxvii, 299.

While pituitary extract is of value in the treatment of uterine inertia in the course of labor, its use to provoke labor is absolutely improper. It has no effect in activating an abortion in progress nor does it assist in the expulsion of a retained placenta in abortion. In all of these cases the uterine musculature is too weak to be influenced by the extract.

The author is of the opinion also that pituitary extract should not be employed during the period of delivery at term. Generally it has no effect when delivery is delayed because of uterine atony without hæmorrhage; in such cases it even tends to disturb normal contractions and to produce instead contractions of Bandl's ring with incarceration of the placenta. When there is hæmorrhage at the time of delivery, pituitary medication should yield to other methods.

In the cæsarean operation Schwaab believes that ergot is preferable to pituitary extract to stimulate uterine contraction.

In postpartum urinary retention, however, the indication for the use of pituitary extract is clear. In numerous cases the contractions of the bladder are stimulated and catheterization is avoided.

Schwaab has never observed any inconvenience with the use of weak subcutaneous injections of pituitary extract, but heavy doses and intravenous injections are apt to cause nausea, delirium, cir-



culatory lipothymia, etc., in the patient and circulatory disturbances and apnea in the fetus. Another effect which many authors ascribe to pituitary extract is tetanization of the uterus either during labor or delivery. In Schwaab's opinion, however, this complication is exceptional when the doses given are weak.

W. A. BRENNAN.

**Ippolito, A.: Remarks upon the Frequency of Shoulder Presentations** (Considerazione sulla frequenza delle presentazioni di spalla). *Gazz. d. osp.*, 1919, xl, 137.

The statistics in regard to the frequency of shoulder presentation in obstetrics varies in different countries as shown in the following figures compiled by Cuzzi: Italy, 1.40 per cent; Austria, 0.71 per cent; France, 0.66 per cent; Belgium, 0.59 per cent; Germany, 0.58 per cent; England, 0.36 per cent; and United States, 0.35 per cent.

In the author's twenty years of professional life in Sicily he saw a shoulder presentation in only 12 of a total of 10,000 labors (0.12 per cent).

In seeking the cause of the variations in the frequency of shoulder presentations in different countries Ippolito found that the explanation must be sought in ethnical and anthropologic differences, especially in the dimensions of the xiphoid-pubic space in the different races. In other words, the frequency of shoulder presentations varies inversely as the mean stature of the race. The Italian mean stature is 162 centimeters, while that of the Anglo-Saxon in Britain and North America is about 173 centimeters. Corresponding differences are observed also in the mean xiphoid-pubic diameter measured from the base of the ensiform to the upper edge of the symphysis pubis.

The conclusions reached by Ippolito are:

1. The frequency of shoulder presentations among different peoples varies inversely as the mean stature. As the mean stature increases the frequency is less.

2. The great frequency of shoulder presentations among Italians as compared with other peoples is explained by the above law.

3. The very marked rarity of such presentations noted in one part of Sicily (Barrafranca), in apparent contradiction to the above law, is explained by ethnical and anatomical factors. In these people, who on the average are of low stature, the xiphoid-pubic line measures more than in races which are much taller.

4. The measurement of the xiphoid-pubic line is very important and in obstetrics ought to be considered nearly as important as the pelvic dimensions.

5. Obstetrics ought to follow the general tendency of the present day in according supreme importance to methods of prophylaxis. Shortening of the xiphoid-pubic line is evidence of pelvic inclination which may be the cause of abnormal presentation, and timely correction of such inclination may obviate danger for both the mother and the child.

W. A. BRENNAN.

## MISCELLANEOUS

**Oastler, F. R.: Some Recent Developments in Obstetrics.** *Am. J. Obst.*, 1919, lxxix, 659.

Today obstetrics is a surgical procedure taught under the general principles of surgery, belonging to the department of surgery, and enjoying the careful technique given the surgical operation. With the assumption of this surgical position in obstetrics has come about the antepartum care of obstetrical patients both in the hospital and private practice.

Modern antepartum care may be summarized as follows: (1) the care of the mother, (2) a thorough examination of the pelvis, (3) a printed card given each patient which details instructions as to habits, exercise, sleep, abnormal symptoms, the adjustment of the corset, the examination of the urine, etc., (4) accurate bi-weekly examination of the urine, (5) methods for ameliorating the vomiting of pregnancy, and (6) the determination of the blood-pressure.

The author mentions, in order to condemn, so-called appointment obstetrics, a procedure conceived more for the convenience of the accoucheur than for the safety of the patient. When once a bag is introduced, the vaginal route is exposed to possible infection, and if other measures have to be taken later, cesarean section, forceps, or version, a natural labor is made dangerous. The induction of labor by bags is an extremely useful procedure when indicated, but only when indicated, and the convenience of the mother and physician is not an indication. The baby has some right in the matter.

Rectal instead of vaginal examinations are rapidly growing in popularity. Experience has shown that internes readily acquire the necessary sense of touch to determine the presentation, and position of the child and the condition of the cervix.

In order to avoid severe laceration as far as possible, the operation of episiotomy has come into favor and justly so. Cesarean section has also taken its proper place among the common surgical procedures of the day. It has supplanted accouchement forcé and high forceps in most cases and the operation of version in many.

That the obstetrical patient of today is better cared for than formerly is emphasized particularly in the gynecological clinics where it is a matter of common knowledge that obstetrical injuries requiring repair are far less common than formerly and that the after-care of the patients has much to do with this.

Bearing children is woman's most glorious work, but also the most serious. Consequently it is her right to be safeguarded. With obstetrics considered to be a surgical procedure and with the introduction of proper care before and after childbirth, mortality and morbidity will be lowered and physicians will receive better compensation for better work. Moreover, when the laity understands the benefits



derived, the physician's compensation will be given gladly and the careless physician and midwife will be in far less demand, possibly even cease to exist.

EDWARD L. CORNELL.

**Taylor, R.: The Measurements of 250 Full-Term New-Born Infants.** *Am. J. Dis. Child.*, 1919, xvii, 353.

Taylor has made an elaborate series of measurements of new-born infants. A total of 250 infants, 125 of each sex, were measured without attempt at selection other than that the babies were normal and born at term. No infant was measured before the second day nor later than the tenth, the purpose being to allow birth traumata to subside and to forestall changes due to extra-uterine growth.

The following measurements were taken: (1) total length from the vertex to the sole; (2) head and neck height—the distance from the plane of the vertex to that of the shoulder; (3) distance between the plane of the vertex and that of the navel; (4) sitting height—the distance between the plane of the vertex and that of the tuber ischii; (5) arm length from the acromion to the tip of the second finger; (6) hand length, from the fold at the base of the hand to the tip of the second finger; (7) leg length, from the great trochanter to the heel; (8) foot length, from the heel to the tip of the toes; (9) intertrochanteric diameter; (10) hip breadth—greatest distance between iliac crests; (11) shoulder breadth—distance between tissues overlying the humeral tuberosities; (12) chest circumference at nipples; (13) occipitofrontal circumference; (14) span—distance from finger tip to finger tip with arms spread; (15) trunk length—the distance from the plane of the vertex to the plane of the tuber ischii; and (16) head height—the distance between the plane of the vertex and the plane of the foramen magnum, the latter being determined by extending a line from the external canthus through the middle of the ear to the occipital region.

The apparatus used consisted of a rectangular baseboard having sideboards at two edges accurately fitted so as to make an angle of 90 degrees with the baseboard. The baseboard was covered with ruled millimeter paper over which was tacked a sheet of celluloid. Distances in centimeters from the sideboards were marked in ink on the millimeter paper. The infant was laid on the celluloid sheet with his head held firmly against one sideboard while his left shoulder touched the other.

As regards individual variation, the spread of the arms was as long or longer than the body length in 81 boys and 82 girls, 65 per cent of total. The head circumference was greater than that of the chest in 119 boys and 120 girls. The trunk length was greater than the arm length in 119 boys and 123 girls, and greater than the leg length in 123 boys and 124 girls. The arm length exceeded the leg length in 111

boys and 107 girls. In the boys the midpoint of the body lay at or above the navel in 114, and below it in 11, the extreme figures being 32 millimeters above and 10 millimeters below. It was at or above the navel in 100 girls and below it in 25. The individual measurements which form the basis of this paper have been placed on file in the Wistar Institute of Anatomy. H. K. GIBSON

**Smith, T.: A Characteristic Localization of the Bacillus Abortus in the Bovine Foetal Membranes.** *J. Exper. M.*, 1919, xxix, 451.

While making a study of the diseased membranes in cases of the infectious abortion of cattle, the writer came upon a peculiar and characteristic habitat of bacillus abortus Bang, i. e., the epithelial covering of the chorion.

This layer of cells which faces the epithelial covering of the uterine mucosa and is in intimate contact with it covers the intercotyledonous areas of the chorion and is continuous with the epithelium of the villousities of the cotyledons which dip into the depression of the maternal caruncles. The cells vary somewhat in height. The vesicular nucleus is round or oval in outline and the chromatin appears as minute spheres against the nuclear membrane, 1  $\mu$  in size. The free border of the cytoplasm is seen frequently in the form of blunt finger-like or conical projections which give the surface a fimbriated appearance. In the specific infectious disease of the foetal membranes these cells, either individually or in series, are densely filled with minute bacilli. The invasion is recognizable under a low-power microscope in that the cytoplasm of the affected cell assumes a blue color when the section is stained in eosin-methylene blue. High-power magnifications resolve this tint into fine, short, rod-like bodies. The bacilli do not lie on the cell or in the ectoplasm, but fill the body entirely. When the microscope is raised or lowered the cytoplasm appears filled in all optical sections.

The authors believe that the significance of this invasion of the chorionic epithelium from the standpoint of pathogenesis cannot be properly evaluated until a more complete history of the successive localizations of bacillus abortus has been obtained. It is safe to assume that this particular cell parasitism is but one of a series of localizations and centers of multiplication in the foetal membranes although evidence points to it as perhaps the earliest stage in which by rapid, unchecked multiplication the organism gains a considerable advantage over the host. The local destruction of an epithelial covering by an infecting agent when other miscellaneous infecting agents are absent may or may not be of much importance, for it depends upon the regenerative activity of the epithelium, the tendency to the gathering of injurious transudates, and the toxic substances associated with the bacilli.

G. E. BEILBY.



## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**O'Connell, A. E.: Roentgenography of the Kidneys.** *Boston M. & S. J.*, 1919, clxxx, 495.

The author covers the subject of renal calculus very thoroughly. He believes that all calculi, except those of pure uric acid, can be demonstrated on a plate of proper quality.

In the detailed discussion of the differential diagnosis of renal calculus special stress is laid on the differentiation from gall-stones.

Pyelography should be used when renal tumor or hydronephrosis is suspected.

The roentgen diagnosis of tuberculosis of the kidney can be made only in cases which show calcified masses in the kidney shadow.

W. A. EVANS.

**Judd, E. S.: Papillary Tumors of the Pelvis of the Kidney.** *J.-Lancet*, 1919, xxxix, 247.

The author reviews the literature of papillary tumors of the kidney and renal pelvis and reports three very interesting cases.

In the first case papillomata were found in the bladder nine months after a nephrectomy. Most of them bulged from the left ureteral orifice but there was one, apparently a graft, which was implanted on the base of the bladder near the urethra. The histology of the papilloma of the kidney and those in the bladder was identical.

The diagnosis of this condition cannot be made definitely until operation. However, the possible presence of an adenoma of papillary type should be considered when there is pain in the region of the kidney extending to the loin, rapid emaciation, a palpable tumor, and hæmaturia.

The treatment is nephrectomy and complete ureterectomy.

J. S. EISENSTAEDT.

### BLADDER, URETHRA, AND PENIS

**Lewis, B.: Some Phases of Operative Cystoscopy.** *Internat. J. Surg.*, 1919, xxxii, 129.

The author summarizes the value of operative cystoscopy and the use of radium, intensive X-ray treatment, and fulguration in cases of carcinomatous growths of the bladder.

Conditions requiring such instrumentation include chiefly obstructive processes at the neck of the bladder, vesical growths and foreign bodies, including stone, and ureteral constrictions and calculi.

Two cases of carcinomatous tumor of the bladder treated successfully with radium and fulguration are reported:

Case 1 was that of a woman 54 years of age who

complained of unduly frequent and painful urination associated with hæmaturia which had continued for three years. Cystoscopy showed the presence of a villous papilloma on the left wall of the bladder including the left ureteral orifice. The pathological examination of a piece of tumor tissue showed it to be a well-defined malignant papilloma.

The growth was treated with electric fulguration (bipolar current) and a week later with twelve hours of 50 milligrams of radium element which was repeated in three months.

Shortly after the last radium treatment cystoscopy showed that a small ulcerated area was all there was left of the former growth. At this time, however, another small tumor was seen anterior to the site of the older growth. This also was fulgurated and about a month later the vesical mucosa was found to be absolutely clear of all evidence of both tumor and ulceration. Apparently there had been complete restoration of health, both local and general. Subsequent reports received after two years have indicated a continuation of this satisfactory outcome.

Case 2 was that of a woman who weighed only 95 pounds and who was apparently in the last stages of decline. Lancinating pain demanded the hypodermic injection of  $1\frac{1}{2}$  grains of morphine daily. The bladder was two-thirds full of a carcinomatous growth. Similar treatment to that used in the first case gradually and progressively reduced the tumor to a mere ulcerated area the size of the finger nail. Coincidentally there was a general improvement in the patient's health and her weight increased to 135 pounds.

In these cases 50 milligrams of the radium element was applied in a capsule enclosed in a black rubber cover to which was attached an ordinary rubber catheter for introduction. The exposures lasted from eight to ten hours and were repeated twice or three times according to the reaction obtained.

In the author's opinion, the radium and X-rays weaken the resistance of the growths and in this way make them more amenable to the direct assaults of fulguration.

Prostatic carcinoma offers distinctly less opportunity for cystoscopic therapy and limits the surgeon to three measures which, though not presenting any certainty of permanent relief, in numerous instances afford a surprising and extended immunity from suffering.

By suprapubic prostatectomy most of the carcinomatous tissues and obstructing material can be removed, leaving a good channel for urination. During and after convalescence from the operation, prophylactic measures against the return of the growth should be taken. These consist of the ap-



plication of the radium element or emanation through the suprapubic wound and successive exposures to intensive X-ray treatment.

Foreign bodies in the bladder, such as hairpins, pieces of straw, etc., may be grasped and removed by means of the operating cystoscope and appropriate accessories. Success in removing calculi depends mainly on their size and density. When they are small or of such soft and phosphatic material as to make them fragile, they may be reduced by successive bites with the bullet forceps to a size which permits their removal through the sheath of the cystoscope or even by dragging them together with the sheath telescope and forceps.

In cases of contracture at the vesical neck an operative measure which has given much satisfaction is the use of the electro-incisor. This is of value, however, only in the contracture form of prostatic obstruction and is not supposed to supplant prostatectomy which is demanded in cases of hypertrophic obstruction. Actuated by the d'Arsonval (bipolar) current, it is capable of burning a deep groove through the offending ring at the neck of the bladder under the direct vision of the operator. The following case reports illustrate its use:

Case 1. The patient was a man 64 years of age. On admission for treatment it was found that the bladder had been drained by means of a catheter introduced through a suprapubic puncture a month previously. The low specific gravity of the urine and the small phthalein output indicated that the kidneys were involved and any radical measure would be dangerous.

The drainage was continued by the author by means of a catheter in the urethra which was well borne. When sufficient recuperation had been attained, the prostatic incisor was used, the deep growth being burned through the neck of the bladder posteriorly. There was no hemorrhage, chill, or fever. The results were striking. Three days after the operation the patient was able to pass urine in a fine stream, emptying the bladder. This operation was performed in October, 1917, and prostatectomy has not been considered since.

Case 2 was a case of contracture of the neck of the bladder with marked infection and symptoms of uræmia. The patient was a man aged 60 who complained of excessive frequency of efforts at urination. The urine was decreased in quantity, highly colored, very clouded with pus, and contained some blood. The residual urine amounted to from 7 to 12 ounces. No enlargement of the prostate was apparent on rectal palpation or cystoscopic examination. The urinary obstruction and residuum continued in spite of repeated postural dilatation and irrigation. Fulguration with the prostatic incisor was then resorted to. There was no reaction, chill, or fever, and the patient has had no urinary trouble in the past year.

Case 3. The patient was a man aged 55 years. For two years there had been undue frequency of urination. At the time of examination the bladder

was distended and contained 26 ounces of residual urine. The prostate was normal, and there were no signs of tabs or lues. Cystoscopy revealed that there was a contracture at the neck of the bladder.

The fulguration with the prostatic incisor was done and repeated three times during the following month. Since then the patient has recovered his good health and urination has been normal. Repeated tests have shown that the residual urine amounts to only from  $\frac{1}{2}$  to 1 ounce.

Case 4 was that of a man aged 70 years who complained of undue frequency of urination which had continued for the past two years. Examination failed to show hypertrophy but contracture of the vesical neck was indicated. There was residual urine in amounts varying from 3 to 5 ounces. Dilatation, massage, and irrigation, resulted in only temporary improvement. The constricted vesical neck was then fulgurated with the incisor, this treatment being repeated four times. Urination finally became free, easy, and markedly less frequent. There was no residual urine. The favorable condition has continued.

The conclusion from these cases is that in appropriate conditions, particularly contracture without prostatic hypertrophy, electric fulguration offers a safe and sane method of enlarging the cervical urethral outlet for better urinary drainage and is without attendant danger from bleeding, sepsis, and other objectionable consequences.

General anæsthesia is never necessary. Local anæsthesia is induced by sacral injection (caudal anæsthesia) or by the direct application of a local anæsthetic through the author's urethral depositor.

Fulguration to obtain a deep groove that widens the outlet may be repeated when necessary.

The author reports an interesting case of the use of cystoscopy in diverticulum of the bladder. The patient was a man 73 years of age who for ten years had had accumulating "bladder troubles." Previously a suprapubic prostatectomy had been performed but without a preliminary cystoscopy. Although the suprapubic wound healed satisfactorily, there was no relief from the "bladder trouble."

When examined by the author, it was found that 8 ounces of residual urine, rank and decomposed, was left after voluntary urination. Cystoscopy showed the orifice of a large diverticulum. A radiogram made after the injection of a 15 per cent sodium bromide solution showed the presence of an adventitious sac with a cavity fully as large as the cavity of the bladder.

Suprapubic removal of this sac was followed by prompt recovery and entire relief from further symptoms.

In discussing ureteral stricture the author cites two cases as object lessons of the results of incorrect diagnosis. In the first case the postmortem examination showed destruction of the kidney due to the



obstruction, backward pressure, infection, and supuration which had been induced by the stricture of the ureteral orifice. The second case was that of a man who had been more or less of an invalid for fifteen years, subject to chills and fever for long periods, and treated for malaria, tuberculosis, and "latent gonorrhœa" without success. Cystoscopy showed yellow pus oozing through the wall of the bladder at a point where the left ureteral orifice ought to be. No urine was at any time obtained from that side. After several examinations it was proved that the left kidney, instead of being a solid tumor, was an enormous pus sac, tense and rigid and absolutely beyond any functional capability. On nephrectomy no cause for the destruction could be found beside the pinpoint constriction at the ureteral orifice. Removal of the kidney was followed by complete recovery of the general health.

The author then discusses cases of ureteral stone. When the stone is blocked higher up in the ureter the first endeavor after the establishment of the diagnosis should be to dilate the ureter below the stone. Before this is thoroughly accomplished, it is decidedly bad judgment to try to grasp the stone in order to remove it directly.

While the method of direct removal with the forceps may seem more gratifying to the patient, success is much more frequent with the more gradual and less spectacular methods of repeated dilatation of the ureter, descent of the stone, and its final expulsion into the bladder from which it is removed either by voluntary urination or by the cystoscope.

A stone of very large size is recognized as being impossible to deliver by cystoscopic measures and therefore falls within the province of the open surgical operation. It should be borne in mind, however, that such operations are attended by serious risks and therefore should be avoided if possible.

Glycerine, liquid albolene, papaverin solution, and other agents have been recommended and used in connection with the catheter for assisting in the removal of a stone but experience has shown that not much reliance should be placed upon them except as adjuvants.

To differentiate a stone from a phlebolith the author recently discovered another method which seems useful. A radiogram taken with an ordinary X-ray catheter displayed a shadow apparently in contact with the catheter. As a further test another radiogram was taken, this time with metal forceps passed well into the ureter. The forceps being more rigid than the catheter used previously straightened out the curve and plainly showed the separation of the shadow from the line of the ureter.

At the close of his article the author describes a ureteral syringe devised by Moore and Lewis, which consists of a glass tube with a rubber bulb. This syringe is convenient for sterilizing and can be easily attached to a ureteral catheter of any size.

THEODORE DROZDOWITZ.

**Cahill, G. F.: Bladder Perforations Seen at the Front.** *Internat. J. Surg.*, 1919, xxxii, 113.

In the recent war, wounds of the bladder were all classified as abdominal perforations and in the evacuation zones constituted between 3 and 7 per cent of the total number of the latter type of injury. Undoubtedly on the battle field this percentage was higher, but when the close proximity of the pelvic vessels is considered, it is evident that extensive lacerated wounds in the vicinity of the bladder were apt to be followed quickly by a fatal hæmorrhage.

The causes of wounds of the bladder were practically the same as those of all other war traumata. The largest number of such injuries were due to fragments of high explosive shells, and the second largest group, to either rifle or machine-gun bullets. A few such wounds were caused by shrapnel balls or fragments of grenades. Bayonet wounds of the bladder were an extreme rarity in the hospitals.

Perforations of the bladder occurred from any angle, cases having been observed in which the missile had traversed the chest and abdomen, the back, the hips, the thighs, and the perineum. Since a large proportion of all wounds were received while the men were in the prone position, a large number of the injuries of the bladder were lateral or posterior perforations.

All vesical wounds were either intra- or extraperitoneal. The intraperitoneal group were associated with other visceral injuries, the most frequent being traumata of the small intestine or the pelvic colon. The outstanding feature in these cases was the injury to the intestinal tract, and upon this the immediate outcome depended. Intraperitoneal wounds were more common than extraperitoneal wounds.

The sooner operation is performed after the injury the better the chances for success. Statistics based upon large numbers of cases show that a patient with intestinal perforation rarely recovers if operated upon later than twenty-four hours after the receipt of the injury.

If operative treatment was determined upon (and this necessitated good judgment), the procedure adopted was that mapped out by those whose knowledge had been gained from long experience with abdominal injuries.

The chief features of the procedure were: (1) a large incision, (2) free exploration of the peritoneal cavity, (3) thorough systematic and rapid inspection of all viscera before any repair, (4) rapid and complete repair of all injuries if possible, (5) extraperitoneal repair of the bladder wound with separate closure of the peritoneum, (6) removal of all foreign material, (7) mopping out of the peritoneum, and (8) closure of the abdominal wound with drainage. It was found best to close the bladder tight if possible and drain it through a catheter, either continuously or intermittently. Wounds of the base of the bladder that were difficult or impossible to close were drained suprapubically.

Extraperitoneal wounds of the bladder were less common and comparatively easier to diagnose and



treat. When seen early, the men having this type of wound were unable to urinate or perhaps passed only small amounts of bloody urine. In some cases urine leaked from the wound. However, there was no peritoneal irritation. When seen later, they presented the picture of extravasation of urine with a large hæmatoma or the beginning of a urine-containing abscess.

In recent cases, repair of the bladder wound after removal of foreign material and contaminated or devitalized tissue and drainage through a catheter either continuously or intermittently gave good results.

Wounds of the bladder and rectum were all treated by suprapubic drainage. It was claimed by the French, especially Legueu, reporting from a French base hospital, that it was better not to repair the rectovesical opening early if it was not in communication with the peritoneum. It was asserted also that these wounds did better if well drained; that a larger number of rectovesical fistulæ closed, and if they did not close, a later plastic operation was preferable. If the bladder, rectum, or pelvic colon was injured, thus involving the peritoneum, the case was treated as an intestinal perforation with repair of the gut, drainage of Douglas' pouch, and suprapubic drainage of the bladder.

In summing up, the fact upon which particular emphasis was laid was that in all vesical wounds the bladder is not the danger point but that the mortality both early and late depends upon the damage to the associated structures.

V. D. LESPINASSE.

**Buerger, L.: The Direct Visual Method in the Treatment of Filiform Strictures of the Urethra.**  
*N. Y. M. J.*, 1919, cix, 798.

The author's universal urethroscope consists of a straight endoscopic tube, two obturators, a light carrier, a telescope, and a magnifying window. The straight tube is longer than that of the ordinary urethroscope ( $7\frac{1}{4}$  inches) so as to be available for work in the bladder as well as in the urethra. Near the ocular end, a large catheter outlet of the type used in the author's operating cystoscope is fused into the tube. Through this, special operating devices, such as rongeur forceps, fulguration electrodes, filiform and larger bougies, catheters, and applicators may be passed. The endoscopic tube is reinforced at the ocular end by a flange and admits the light carrier with a watertight joint. Two faucets also fit into the cuff. These give entrance and exit to fluid for the distension of the urethra which improves the clarity of the visual field and aids in the manipulation of the instrument. The two sizes of endoscopic tubes which have been found most useful, Nos. 24 and 25 French, are provided.

In order to convert the telescopic instrument into an air-inflating instrument, an Elsner-Braasch cystoscope, or an ordinary straight tube urethroscope, a magnifying window is provided which serves

not only to close the tube for air-inflation or water-distension, but also to magnify the direct picture slightly and obviate the necessity for accommodation of the eye at so close a distance.

In short, the instrument is universal in that it combines the uses of the following: (1) an open-air anterior and posterior urethroscope; (2) an air-inflation anterior and posterior urethroscope; (3) a direct telescopic cystoscope (to replace the Brown); (4) a direct telescopic operating cystoscope; (5) an operating, irrigating, anterior and posterior, non-prismatic telescopic urethroscope; (6) an Elsner-Braasch urethroscope and cystoscope, and (7) a Kelly or Luys endoscope and cystoscope.

This universal cysto-urethroscope is recommended chiefly as an irrigating telescopic instrument for the bladder and the posterior and anterior urethra. The technique of its use is as follows: the sheath fitted with the curved obturator is introduced into the bladder, the obturator removed, and the bladder irrigated if necessary. The light carrier and the telescope are now locked in place and the irrigating fluid allowed to flow through one of the faucets, a rubber tip or cap having been adjusted at the catheter outlet. The trigone, ureters, bas-fond, and posterior wall of the bladder may be adequately illuminated and brought into view and the examiner may then proceed with the examination of the neck of the bladder and urethra.

For those who employ the direct cystoscopic method by preference, both ureters may be catheterized according to the well-known principles of manipulating non-prismatic cystoscopes. When the neck of the bladder and urethra are to be examined with the water flowing, the instrument is slowly withdrawn, a periscopic view of the urethra being obtained. As soon as the membranous urethra is brought into view, it is well, while manipulating the cysto-urethroscope with the right hand, to grasp the penis with the left hand in order to prevent reflux of the irrigating fluid. The degree of dilatation of the urethra is controlled by both the height of the irrigator and the patency of the irrigating faucet.

In the treatment of filiform stricture the obturator designed for the anterior urethra is inserted with the patient in the usual cystoscopic position, and the sheath then introduced until it meets the resistance of the strictured area. The obturator is then removed and the telescope with the filiform bougie in place is inserted. While the assistant grasps the corpus cavernosum of the penis to prevent reflux, the irrigating fluid is allowed to distend the urethra. The orifice of the stricture is now sought and can often be clearly demonstrated as a sharply defined black hole, centrally or excentrically placed. At times it is obscured by a shelf of scarred mucous membrane. By manipulating the filiform bougie back and forth, like a ureteral catheter, and by movements of rotation, it can be readily made to enter the stricture and the bladder. The screw end of the bougie is now held or pushed inward and the telescope withdrawn. The sheath



or endoscopic tube is then removed, care being taken not to dislodge the bougie. Further procedure is according to the well-known principles of dilating strictures.

THEODORE DROZDOWITZ.

### MISCELLANEOUS

**Stevens, A. R.: Experiences in France with Surgery of the Genito-Urinary Tract.** *J. Am. M. Ass.*, 1919, lxxii, 1589.

Stevens' paper deals with the frequency of gunshot wounds of the urinary tract and his personal experiences in genito-urinary surgery during the recent war.

The author was impressed with two facts concerning war wounds of the urinary tract: first, the relatively small number of cases in the hospitals, and second, the high mortality. With reference to the frequency of these injuries, he states that various groups of statistics show that the kidney is involved in from 4 to 9 per cent of penetrating abdominal wounds, and the bladder in from 4 to 7 per cent.

In the recent war the mortality of patients with wounds of the urinary tract was very high. According to a French publication giving collected statistics, non-complicated bladder wounds resulted in a mortality of 56 per cent. Stevens' experiences seem to corroborate this figure. He has a record of eleven patients who reached a base hospital with vesical wounds or wounds adjoining the bladder, of whom, to his knowledge, at least six died.

The high mortality of vesical injuries is due, not only to the intraperitoneal and pelvic complications, but also to wounds in other parts of the body which handicap the patient seriously and materially reduce his chances for recovery. Of four patients wounded through the perineum who came under the author's observation only one recovered.

In the treatment of suprapubic wounds, it is advisable to close a wound of the bladder which is on the peritoneal surface, but to drain an extraperitoneal opening. Attention is called to the necessity for removing all loose bits of bone in complicating fractures of the pelvis.

The author has seen eighteen or twenty cases of bladder complications of gunshot wounds of the spine. The treatment resorted to consisted of infrequent catheterization, suprapubic drainage, and the "do nothing" plan. He is convinced that the last method is not of universal application. The harm done to the kidneys by a continuously large amount of residual urine in the bladder probably represents a smaller risk than that of urinary infection from repeated catheterization.

The article contains several interesting case reports.

H. L. KRETSCHMER.

**Luys, G.: War Wounds of the Genito-Urinary Organs.** *Med. Rec.*, 1919, xcvi, 734.

In summarizing his experience in the urological service of the military hospital Dominique Larrey,

Versailles, the author treats the genito-urinary organs individually, giving full case reports.

### WOUNDS OF THE URETHRA

When the patient arrives with extensive damage to the urethra and there is difficulty of urination, the first thing to be done is to deviate the urine by hypogastric section. This prevents the urine from reaching the infected focus, thus permitting a more rapid cicatrization of the wound, and protects the patient against continued suffering at the time of micturition. In consequence of such deviation of the urine, plastic operations performed on the urethra are more apt to be successful than if a permanent catheter is used.

Regarding the operative procedures for the radical cure of pubic or scrotal fistulae following war wounds, the author has found that the method of Duplay undoubtedly offers the best security.

Another method which has been advocated for urethral fistulae is cutaneous inversion. This, however, seems to yield favorable results only in cases of small fistulae. Still other procedures in the form of autoplasmic operations with flaps or transplantation of the mucosa may be employed in suitable cases. In the course of such procedures great care should be observed in the matter of intra-urethral manipulations. Unless a hypogastric section has been performed for the deviation of the urine, the catheter should not be left in situ but intermittent vesical catheterization (four or five times in twenty-four hours) should be done.

Under all circumstances, and when the operative procedures have led to closure of the urethra, it will be necessary later on to restore the caliber of the canal by means of gradual systematic dilatation with sounds.

Wounds of the deep urethra are more difficult to cure and require multiple interventions. In such cases a deviation of the urine should be effected by the suprapubic route in order that the urethrorectal fistula may be treated under more favorable conditions.

Various procedures have been advocated for the cure of urethrorectal fistulae. The most simple consists in liberating the rectum from the deep urethra through a long perineal incision and then suturing the urethral and rectal gaps separately.

Another method consists in lowering the rectum so as to make possible a complete separation of the fistulous rectal segment, then shifting the rectal wall as a whole in such a way that only a perfectly healthy portion of the rectum lies opposite the urethral gap.

A most interesting operation proposed by Rochet of Lyons is the ischopubic separation of the insertion of the middle perineal aponeurosis to gain access to the wound.

### WOUNDS OF THE BLADDER

Most frequent among wounds of the genito-urinary tract are injuries of the bladder and urethra.



Vesical wounds may be uncomplicated or associated with lesions of the neighboring organs.

Almost invariably bladder wounds are combined with fractures of the bony pelvic girdle, particularly fractures of the pubis, or with perforations of the intestines. In such cases the wound in the bladder is secondary and is relegated to the background by the symptoms of peritonitis which accompany the intestinal injuries. Adhesions develop and the patient may void urine from points at a great distance from the bladder. Of three patients under the author's observation, one passed urine through an opening in the upper part of the right thigh while in the other two cases it was passed from an orifice on the posterior aspect of the buttock.

Wounds of the bladder may sometimes remain undetected and therefore a very careful search should be made for them. The most important consideration in the treatment is the establishment of adequate urinary drainage. The diagnosis of the condition having been established, it is necessary first to locate the opening into the bladder in order to introduce a drainage tube.

On account of the associated lesions in war injuries of the bladder, primary suture of the wound rarely seems practicable. Drainage is the only alternative, and for this the anterior median route is best.

Among the complications which may arise is the presence of bony splinters due to fracture of the pelvis which enter the bladder and after the closure of the wound may form the nuclei of vesical calculi.

The arrest of projectiles in the interior of the bladder is relatively rare. Only a combination of exceptional circumstances permits the observation of such cases for as a rule projectiles pass directly through the bladder, perforating its wall and frequently also the rectum. However, since simple penetration of a bullet into the bladder undoubtedly occurred in one case, it is permissible to assume that there are other cases of the same kind. The dangers threatened by foreign bodies left in the bladder are well known for they invariably become incrustated with lime salts and serve as nuclei of vesical stones. The presence of foreign bodies in the bladder must therefore be ascertained. This can be done with an ordinary explorer or metal sound or still better, with the cystoscope. The author's "direct-vision" cystoscope makes it possible to see and localize a foreign body accurately, to seize it under the control of the eye, and extract it rapidly.

#### WOUNDS OF THE KIDNEY

Gunshot wounds of the kidney are relatively few and may be simple or associated with lesions of other organs. When the kidney is only incidentally damaged by a projectile which injures other abdominal organs, laparotomy becomes imperative.

When the wound is limited to the kidney, a distinction must be made between several varieties. In some cases the projectile has passed through with-

out causing any appreciable permanent lesions. Hence, when there is reason to suspect a renal wound expectant measures are in order before surgical interference. In favorable cases the originally profuse hæmaturia will subside progressively. However, when there is severe perineal hæmaturia, indicated by thickening in the lumbar region, a radiograph should be taken. If the presence of a foreign body is discovered, intervention is necessary.

Operative indications in the course of war wounds of the kidney are positive also when the renal hæmorrhage, instead of stopping, becomes aggravated or when the kidney presents a well-marked pyonephrosis. In cases of secondary pyonephrosis, the treatment is the same as in pyonephrosis due to any cause, interference with the diseased kidney being permissible only when its fellow has been found, by segregation of the urine, to be perfectly healthy and able to care for the entire excretion of urine.

#### WOUNDS OF THE TESTICLE

Gunshot wounds of the testicle are not uncommon. As a rule, they are associated with other lesions of the urethra or the bony walls of the pelvis, and frequently are accompanied by wounds of the thighs. In exceptional cases the injury is limited to the testicles alone. The treatment to be adopted in this class of injuries must be pre-eminently conservative unless the organ has been completely destroyed and its preservation is absolutely impossible.

The utmost care should always be exercised to preserve, if not the entire organ, at least the larger portion of it. In other words, castration should be performed rarely and only as a last resort. In this connection, the author cites the case of a young soldier, 23 years of age, who was wounded by a bullet which passed through both testicles in such a way that after the wound had healed only two small stumps were left, evidently without any testicular secretion. In consequence of this injury, the patient sank into a state of extremely pronounced neurasthenia, with mental, moral, and physical depression of a very marked type. No internal treatment proved successful in restoring his previous state of health.

THEODORE DROZDOWITZ.

#### Timme, W.: A New Pluriglandular Compensatory Syndrome. *Med. Clin. N. Am.*, 1919, ii, 959.

The author describes a syndrome which he attributes to disproportionate function of the thymus, the adrenals, and the pituitary glands. The condition begins some years before puberty and presents largely the characteristics of the so-called status thymicus-lymphaticus. In the author's opinion this is due mainly to hypofunction of the pituitary and other endocrine glands, but a hyperfunction of the thymus.

During the second stage, which is ushered in at puberty or some time after puberty normally



occurs, the symptoms and signs become more marked and the growth of the body is very rapid. This increased growth, Timme believes, can be explained by the assumption of Tandler and Gross that there is either a deficiency of the gonadal inhibition to growth or "thymic giantism." The great fatigability, the low blood-sugar content, the low blood-pressure, and the white line of Sergeant he credits to a deficient adrenal chromaffin system.

With the third stage, at about the twentieth year of life, a compensatory change begins and is completed at the fourth stage from three to ten years later. The compensation is then complete or the untreated case takes on the attributes of the condition due to enlargement of the pituitary body following the earlier manifestations of the thymic state. In the former condition the acromegalic features are retained, but the blood-pressure and blood-sugar have returned to normal and the headaches and fatigue have disappeared; in the latter, the headaches, the fatigue, and other symptoms gradually become more severe. These changes are due presumably to hypertrophy of the pituitary gland, an assumption which the author substantiates by X-ray findings.

Timme has found that adrenalin is valuable to tide the patient over exceptionally bad days of fatigue and exhaustion, but the prime agent, which is almost a specific, is pituitary gland extract in one of its varied forms. This is valuable not only in the third stage, but also when there is no compensation by hypertrophy of the pituitary body.

Case histories, photographs, and X-ray plates illustrating the various stages of the syndrome are given.

C. M. GRUBER.

**Hinman, F.: The Cystoscopic Study of Urologic Conditions in Children.** *Am. J. Dis. Child.*, 1919, xvii, 305.

Abnormalities of the urinary tract in children apparently are not prevalent, and accurate methods of diagnosis are almost universally neglected.

In recent years the perfection of small-caliber instruments has made possible the direct application to the field of urology in children all of the knowledge and experience gained in the development of general urology during the last twenty or twenty-

five years. It is a simple procedure to cystoscope the bladder and catheterize the ureters of girls of any age, and of boys over 4 or 5 years old. For little fellows under 4 an external urethrotomy, which is not mutilating or dangerous, permits the examination.

The author emphasizes the value of the simple X-ray examination in children to show the size and shape of the kidney.

Of twenty-six children in whose cases a cystoscopic examination was made, the youngest boy was 3 years old and the youngest girl 11 months. Of twelve girls with pyuria examined cystoscopically, the youngest was 11 months and the oldest 14 years of age. Six of these cases were acute or subacute infections and six chronic. In three of the acute and three of the chronic cases the infection was limited to the bladder; microscopic and cultural studies of the catheterized kidney urines were negative. In all twelve cases there was cystoscopic evidence of bladder inflammation. In the six cases of pyelitis the infection was confined to the left side in two and was bilateral in four. The total of the phenolsulphonephthalein was normal in all. In other words, of twelve cases of clinical pyelocystitis, simple cystitis was present in 50 per cent, bilateral pyelitis and cystitis in 33 per cent, and unilateral pyelitis with cystitis in 16 per cent. *Bacillus coli communis* was cultivated from the urine in all but one case in which a pure culture of staphylococcus was obtained. In all of the ureteral catheterizations silver nitrate in strengths of from  $\frac{1}{4}$  to 2 per cent was used as a pelvic lavage before the withdrawal of the catheters.

The quick and remarkable benefit following silver nitrate lavage of infected kidneys is worthy of attention. The procedure takes from five to ten minutes, and as it is done under primary gas and oxygen anaesthesia, without trauma or other bad effects afterward, no hesitancy is felt in strongly advising this logical method in cases resisting ordinary methods of treatment.

The author has diagnosed also renal tuberculosis, nephrolithiasis, congenital posterior ureteral valve, bladder stone, and urethral stone in children under 5 years of age.

In conclusion he states that it is technically possible to apply modern cystoscopic methods to a child of any age.

V. D. LESPINASSE.

# SURGERY OF THE EYE AND EAR

## EYE

**Török, E.: Tuberculin in the Diagnosis and Treatment of Eye Diseases.** *Arch. Ophthalm.*, 1919, xlviii, 242.

This paper is well summarized in the following conclusions:

1. An eye condition should be considered tuberculous only when a positive focal reaction has been observed.

2. When a positive focal reaction cannot be obtained, but the patient shows a positive general and local reaction, and other possible causes for the eye condition are excluded, the case may be considered as probably of tuberculous origin.

3. For diagnostic and therapeutic purposes tuberculin should always be used in fresh solution.

4. For diagnosis in eye conditions only the subcutaneous injection is of value.

5. Tuberculin is a valuable remedy in ophthalmic therapeutics provided it is used in eye affections in which a positive focal reaction has been obtained.

6. The treatment should be continued for a long time.

7. Scleritis, deep and interstitial keratitis, and iridocyclitis are closely related to each other and are not separate entities. That they may change from one to the other is a clinical observation borne out by the pathologic findings of Treacher Collins.

8. Exudative choroiditis is seldom of tuberculous origin, the source of infection being usually the teeth.

S. S. HOWE.

**Grout, G. H.: Experiences in Reparative Surgery after War Injuries of the Eyes.** *Arch. Ophthalm.*, 1919, xlviii, 227.

The problem of late restorative work on the eye is fully as, if not more difficult to solve than, that of an operation performed early, as the original operation must be repeated after the formation of scar tissue. For operations of this kind the anæsthetic recommended is novocaine-adrenalin solution as most of the work is for cosmetic purposes and the patients stand the pain better than the after-effects of ether.

In coloboma of the lids the procedure of Blaskovics was generally followed.

In severe laceration of the eye-ball it sometimes happened that scleral tags were driven into the orbital fat and not removed when enucleation was done without due care. These afterward caused pain and necessitated a secondary operation.

In 300 enucleations no cases of sympathetic ophthalmia were seen.

In cases of retracted ectropionized lower lids the

epithelial inlay of Esser was used. This consists in implanting a dental plaster mold covered with egg albumin and a Thiersch graft into the cavity formed by excising the scar tissue, suturing the skin over it, and in ten days, when the mold is removed through an incision from the conjunctiva, immediately inserting a prosthesis to maintain the cavity.

Gilles of London uses what is called an "epithelial outlay" in cicatricial ectropion of the upper lid. The mold covered with a Thiersch graft is sutured in the cavity formed by excising the scar tissue as in the Esser procedure and removed through the original skin incision ten days later, the epidermized cavity being allowed to flatten out and the lid consequently to drop.

S. S. HOWE.

**Schweinitz, G. E. de.: Concerning Concussion and Contusion Injuries of the Eye in Warfare.** *Am. J. Ophthalm.*, 1919, ii, 313.

Routine examination of the eyes of wounded soldiers has often revealed elaborate retinochoroidal and vitreous changes when there were no external manifestations of injury. Bonnet is quoted as explaining such a condition by the statement that the driving of the blood column into the small vessels of the eye may rupture them and cause varying degrees of injury.

It is interesting that in severe concussion resulting in commotio retinæ vision may be completely lost for several days.

Prolonged hypotony sometimes occurs after contusion, but marked reduction in intra-ocular tension does not necessarily mean perforation of the globe.

Concussion sent through the maxillofacial area of one side and causing ipsilateral ocular lesions is probably prevented from affecting the other eye by the accessory sinuses which do not transmit the shock to the other globe.

The difference between concussion changes of the fundus in civil and in military practice is due in great measure to the fact that under ordinary circumstances the blow is delivered by an object which is moving comparatively slowly while in warfare the object moves rapidly.

There is a striking analogy between the mechanism of concussion injuries of the eye and those of the brain.

S. S. HOWE.

**Vail, D. T.: Types of Orbital Abscess and Exophthalmos Due to Intranasal Suppurative Processes.** *Laryngoscope*, 1919, xxix, 263.

In the cases of orbital abscess seen by the author the condition was due to direct extension of the suppurative process from an empyema of one of the accessory nasal sinuses through an actual gross de-



fect in the orbital wall adjoining the involved sinus. He contrasts this finding with the old conceptions of metastatic abscess due to a septic embolus, and of "septic thrombosis."

A sinus empyema may discharge its contents by any one of three routes: (1) through its blocked nasal ostium, the most usual occurrence; (2) through the wall of the cerebral fossa, producing an extradural abscess; and (3) through the wall of the orbit, producing an orbital abscess. As the pus under pressure in the sinus breaks through the orbital wall, it first elevates and later bursts through the periosteum into the orbital tissues.

The condition described produces a striking clinical picture the essential features of which are a deep boring pain, chill, prostration, high temperature, and exophthalmos with œdema of the eyelids. The position of the proptosed eyeball usually indicates which sinus was the seat of the primary abscess.

The author reports four cases in which the orbital abscess was produced respectively by empyema of the sphenoid sinus, the posterior ethmoid cells, the anterior ethmoid cells, and the frontal sinus. The autopsy findings in two fatal cases are given and the operative findings in all four. W. F. MONCREIFF.

**Gougelmann, P.: From the Standpoint of the Artificial Eye Maker.** *Arch. Ophthalm.*, 1919, xlviii, 268.

Before inserting a permanent prosthesis, a temporary eye should be worn for a fortnight before the fitting is made. It should be remembered that a small eye is less disfiguring than an eye that is too large.

Ordinarily an eye can be worn comfortably for one year, but instances are known in which one has been worn for twenty years without removal.

Acid conditions of the system cause a crystalline deposit that makes the eye as rough as a file or causes a discoloration of the sclera. The latter, however, can be removed by a peroxide bath.

A mold of the socket such as is often suggested is not practical because the eye is made by hand and the contour of the mold cannot be identically reproduced.

The disadvantage of the gold or glass ball implantation is that it sets too far forward and requires too thin a prosthesis. Fat implantation seems to be the best solution of the problem of furnishing a movable stump as in one case of ten years' standing it was found that the fat was not absorbed.

S. S. HOWE.

**Alling, A. N.: Fat Transplantation into Tenon's Capsule after Enucleation.** *Arch. Ophthalm.*, 1919, xlviii, 263.

Although fat is of relatively low vitality, it is almost invariably retained and becomes organized when implanted into Tenon's capsule after enucleation. It shrinks to a certain degree but never to

less than one half its original size, and a sufficiently large stump remains permanently so that the artificial eye is not sunken and has considerable motility. When too much fat is used the conjunctival sutures may give way. In a short time, however, the exposed tissue becomes granulated over. S. S. HOWE.

**Howard, H. J.: Implantation of a Glass Ball within Tenon's Capsule by Verhoeff's Method.** *Arch. Ophthalm.*, 1919, xlviii, 265.

Because it was found that glass balls implanted in Tenon's capsule with suturing of the muscles in front of them either came out or became displaced into a quadrant space between two of the muscles, Verhoeff developed the technique of cutting the muscles at their insertions and allowing them to retract. An 18 mm. glass ball is then inserted within Tenon's capsule and the capsule closed by means of a double armed silk suture the two ends of which are tied over a pearl button.

As the pressure of Tenon's capsule is uniform over its surface, it is impossible for the ball to become displaced and the motility of the artificial eye is said to be as good when the muscles are allowed to slip back as when they are sutured in front of the ball.

S. S. HOWE.

**Sweet, W. M.: Implantation of a Metal Ball in Tenon's Capsule.** *Arch. Ophthalm.*, 1919, xlviii, 257.

Since 1904, the author has done 146 enucleations with implantation of a metal ball in Tenon's capsule. Later extrusion of the ball occurred in only 4 cases. The conclusions drawn are as follows:

1. In practically every case the stump gives a more movable artificial eye than ordinarily follows simple excision. In some cases of enucleation in which the muscles have been sutured to the conjunctiva and care is taken to preserve all conjunctival tissue, an excellent movable prosthesis is secured, but this result is uncertain.

2. With this method the depression of the tissues immediately beneath the brow and the tendency to exophthalmos of the artificial eye are less marked.

3. The floor of the orbit after healing is flat, with occasionally a slightly raised portion in the center where the implanted ball projects forward, a condition which is better than the deep, furrowed, and often irregular socket that so often follows simple enucleation.

Contra-indications are malignant growths and purulent inflammation.

In the operation described there is no greater danger of sympathetic ophthalmia than if ordinary excision were performed without implantation of the gold ball. When it does occur, the author believes it would have developed no matter what operative procedure had been followed.

S. S. HOWE.



**Van der Heydt, R.: Fundus Pathology with the Red-Free Light of Vogt.** *Am. J. Ophthalm.*, 1919, ii, 334.

The examination of the fundus by means of red-free light discloses many details not observable by ordinary illumination, e. g., the yellow coloring of the macula, the yellow discoloration in the lens in age, and the nerve striations of the retina in optic atrophy. While with ordinary illumination no changes are observed in the atrophic eye except those of atrophy at the nerve head and its vessels, with the red-free light we find a total absence of the retinal striations and a thin whitish line, ordinarily invisible, on either side of the vessels.

Vogt has described honeycomb-like changes in the macula which are visible only in the red-free light. These vacuole formations he believes are due to cystic degeneration of the macula. The bursting of some of their thin anterior walls accounts for the condition which is known as "hole in the macula."

As many conditions can be seen better with ordinary light than the red-free light, it is not expected that the former will be superseded. Rather will the red-free be regarded merely as a valuable and helpful aid in the diagnosis. S. S. HOWE.

#### EAR

**Goeckerman, W. H., Barlow, R. A., and Stokes, J. H.: The Diagnostic Value of Lowered Bone Conduction in Syphilis.** *Am. J. Syphilis*, 1919, iii, 240.

The following conclusions are presented relative to the diagnostic value of lowered bone conduction in syphilis:

1. The so-called lowered bone-conduction test (reduction in conduction of sound by bone as compared with otherwise normal hearing) was positive in 78 per cent of known syphilitics in the series studied.

2. From the otologic standpoint the test is of value only if a complete hearing test is made.

3. The efficiency of the test varied greatly in different types of syphilis, being at its best in late cutaneous syphilis (100 per cent), latent syphilis (80 per cent), and syphilis of the central nervous system (80 per cent). It had almost no value in osseous lues, and the results in early syphilis were inconclusive (too few cases). A negative Wassermann test combined with a negative bone conduction test is strong evidence of the absence of syphilis.

4. The test agreed with the positive or negative diagnosis of syphilis in 67 per cent, and disagreed in 33 per cent.

5. The test was positive also in 48.7 per cent of patients in whom syphilis could apparently be excluded.

6. On the whole, therefore, the test has only a restricted value as a diagnostic aid owing to its high factor of error. O. M. ROTT.

**Fraser, J. S., and Garretson, W. T.: The Radical and Modified Mastoid Operations; Their Indications, Technique, and Results, with Notes on Labyrinthine and Intracranial Complications of Chronic Middle-Ear Suppuration.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Otol., 29.

The conclusions reached are based on an analysis of 306 cases of chronic middle-ear suppuration as follows: cases treated by a radical mastoid operation, 238; cases in which a modified radical mastoid operation was performed, 17; labyrinthitis, 26; intracranial complications, 25.

The indications for the radical operation were: (1) chronic suppurative otitis media and failure of conservative treatment, 33 cases; (2) chronic suppurative otitis media with polypi or granulations, 93 cases; (3) chronic suppurative otitis media with pain, mastoid tenderness, and polypi, 57 cases; (4) chronic suppurative otitis media, acute exacerbation and subperiosteal abscess, 10 cases; (5) chronic suppurative otitis media, posterior perforation, with or without cholesteatoma, 10 cases; (6) chronic suppurative otitis media, attic perforation, with or without cholesteatoma, 24 cases; (7) chronic suppurative otitis media with a sinus over the mastoid, 4 cases; and (8) failure of previous mastoid operation, 17 cases.

The authors prefer to try the modified radical operation instead of the radical (1) when good hearing remains in the diseased ear, and (2) when there is moderate hearing in the diseased ear and the other ear is distinctly deaf.

In the matter of technique the method of skin grafting described by Marriage was used in all except 13 cases for the following reasons: (1) the presence of symptoms of fistula; (2) erosion of the canal; (3) exposure of the dura of the middle fossa; (4) exposure of the middle fossa, giddiness, and abnormality of the canal prominence; and (5) exposure of the sigmoid sinus by disease and erosion of the lateral canal.

In discussing the results of the radical operation when skin grafting was not done, the authors state that of 171 patients, 107 presented themselves for inspection at periods of from three months to five years afterward. Three of these 107 were patients who had had both ears operated upon, so that 110 of the 178 ears treated were seen. Of these, 37 appeared to be cured, while 10 others were very satisfactory except that they showed want of care (an accumulation of wax and desquamated epithelium). This gives 43 per cent of cures. In 24 cases the inner wall of the cavity was moist but there was no pus. In 27 cases there was still some purulent discharge. In 1 case the cavity was filled with cholesteatoma. In 3 cases a false membrane had formed, almost shutting off the deeper part of the cavity. In 4 cases there were granulations in the cavity. One showed a keloid in the mastoid scar and a large amount of debris in the cavity. In 35 cases the hearing was improved, in 36 there was no change, and in 22 it was worse.



Of the 63 patients upon whom skin grafting was done, 44 presented themselves for inspection at periods of from three months to two and a half years after operation. Two of these were patients who had had both ears operated upon, so that 46 of the 70 ears treated were seen. Of these, 20 appeared to be cured and 12 others were quite satisfactory except that they showed want of care. In 7 cases the inner wall was red and moist. In 4 cases a slight purulent discharge persisted, and in 1 case there was a foul-smelling profuse discharge. Two cases showed a membrane-formation with a narrow opening into it through which pus drained when the patient performed Valsalva's experiment. In 12 cases the hearing was improved, in 16 there was no change, and in 6 it was worse.

Twelve of the 17 patients upon whom a modified radical operation was performed reported after operation. Of these the condition of 9 was quite satisfactory. In 3 cases the cavity was still moist. In 10 cases the hearing was improved, in 1 it was unchanged, and in 1 it was worse. O. M. ROTT.

**Tod, H.: Septic Infection of the Lateral Sinus Accidentally Injured During the Operation of Mastoidectomy.** *Proc. Roy. Soc. Med., Lond.*, 1919, xii, Sect. Otol., 62.

Tod reports six cases of septic infection of the lateral sinus accidentally injured during the mastoid operation. On the basis of these he draws the following conclusions:

1. Whenever the lateral sinus is exposed during the mastoid operation, it should be carefully inspected at the end of the operation to see if it has been injured in the slightest degree.

2. If the sinus-wall has been injured the wisest procedure is to expose it freely on each side and obliterate its lumen completely by means of gauze packing well beyond the affected area. This procedure is suggested by the fact that septic infection of the lateral sinus does not occur when the sinus-wall has been cut clean through and its lumen at once obliterated by pressure to arrest the hæmorrhage.

3. There may be no evidence of infection of the lateral sinus until about the tenth day after the mastoid operation, when a sudden rigor may be the first symptom. As a rule, however, there is pyrexia with increased pulse-rate for one or two days previous to this. These symptoms should be looked upon as danger signals, and if there be no other cause for them the mastoid wound should be reopened, the sinus wall explored, and if necessary incised.

4. If hæmorrhage occurs from the mastoid wound a few days after the operation, it is not sufficient to arrest it by applying pressure to the bleeding spot. The bone should be removed from the sinus wall above and below the affected area and gauze plugging inserted between the bone and

the outer wall of the sinus, the sinus then being slit up and explored. Further surgical treatment depends upon what is found. Hæmorrhage from the sinus after the mastoid operation means that the wall has been injured or that it was already infected at the time of the operation. Hæmorrhage associated with pyrexia or a rigor always means septic infection of the lateral sinus and indicates an immediate and thorough operation.

5. The internal jugular vein should always be ligated in cases of septic infection of the sinus in which hæmorrhage has occurred, as in these cases the thrombus is probably diffuse and the walls of the sinus already infected even to a greater extent than is evident to the naked eye.

6. Intermittent pyrexia of a septic type without rigors, beginning after an interval of about ten days after the mastoid operation, should always suggest blood infection through the lateral sinus and warrants exposure of the sinus and probably its obliteration after exploration. This condition must not be confused with the intermittent pyrexia which may occur for some days after an operation for acute inflammation of the mastoid, the result of scarlet fever or streptococcal infection, which is probably due to toxic absorption from the affected wound surface itself and usually subsides without further surgical interference. O. M. ROTT.

**Eagleton, W. P.: The Reconstruction of the Mastoid Wound Cavity by the Use of Bone Grafts and Chips.** *Laryngoscope*, 1919, xxix, 272.

Eagleton discusses reconstruction of the mastoid wound cavity by the use of bone grafts and chips, reporting his experience in two cases. In one the transplantation was done at the time of the mastoid operation, and in the other, with better results, at a secondary operation following the sterilization of the wound cavity by the Carrell-Dakin method. In both cases, however, the ultimate result was ideal, a smooth, flat surface covering the former mastoid cavity.

The advantages cited for this method of closure are that: (1) it does away with the painful dressings; (2) decreases the possibility of secondary infections, and (3) decreases the possibility of a recurrence of the original infection.

The prerequisites to this method of closure are: (1) the eradication of the infection by a complete operation with a perfect aseptic technique at the time of operation; (2) the filling in of the cavity of the mastoid so that no extensive vacant spaces will remain for the accumulation of blood in which the remaining bacteria and those in the neighboring middle ear may propagate; (3) the erection of a barrier posterior to the iter tympani et antri, in order that, though a cavity is left into which the mucous membrane of the middle ear can proliferate, this cavity is small—an antrum—and thus imitates nature's process of repair. O. M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Laurens, G.: Local Anæsthesia in Otorhinolaryngology** (De l'anesthésie locale en oto-rhino-laryngologie). *Presse méd.*, Par., 1919, xxvi, 300.

Local anæsthesia may be employed for all operations on the face, ears, and upper respiratory tract, and is better than general anæsthesia. If analgesia is incomplete the fault is generally the surgeon's and due to faulty technique, haste during the operation, or rough manipulation. Either the infiltration or regional methods of inducing local anæsthesia may be used and at times both may be combined. The advantages to the surgeon and patient are: simplicity, minimum toxicity, and, in laryngeal operations, diminution in the shock and asphyxia.

The surgeon must inspire absolute confidence in the patient and assure him that the pain will be reduced to a minimum. The psychic, suggestive, and moral effect must not be overlooked. The technique ought to be above reproach, the anatomical points known exactly, and the instrumentarium correct. Gentleness is essential in dealing with the tissues, and in opening the cranium and sinuses an electric motor should be used instead of the gouge and mallet. The anæsthetic should consist of a 2 per cent novocaine solution with the addition of 25 drops of adrenalin for each 100 cubic centimeters. A larger amount of adrenalin makes possible the occurrence of postoperative hæmorrhage, hæmatomata, and abscesses.

To anæsthetize the laryngeal cavities in the course of thyrotomy and laryngectomy the author recommends injecting a solution of cocaine through the cricothyroid membrane.

W. A. BRENNAN.

**Lannois: Radium Therapy of Tumors in Otorhinolaryngology** (La radium thérapie des tumeurs en oto-rhino-laryngologie). *Bull. Acad. de méd.*, Par., 1919, lxxxi, 638.

Lannois gives a short historical review of the radium treatment of tumors of the upper respiratory tract and reports 43 cases treated in this way by himself. These included 16 amygdaloid tumors, 6 tumors of the nose and sinuses, 4 tumors of the nasopharynx, 3 tumors of the ear, and 14 laryngeal tumors.

Tubes containing radium bromide in amounts of 28, 30, 48, and 60 milligrams were used. The strongest dose possible was employed and the tube left in place for at least twenty-four, and often for as long as thirty-six or forty-eight hours. Although in some cases a second application was necessary, it was deferred as long as possible owing to the risk of burns, etc. There was only 1 severe complication of this kind.

In the 16 cases of amygdaloid tumors there were 6 recoveries. These tumors were lymphadenomata or sarcomata. Many of the others cases have been improved. Of the 6 cases of nasal tumors the majority were cured. In the 4 cases of nasopharyngeal tumors the results were good. Most of the growths in the latter group were sarcomata. In the 14 cases of laryngeal tumors there were 3 recoveries but these were not definite. The laryngeal tumors were mostly epitheliomata.

In general, the condition of patients with malignant tumors which are not epitheliomata has been improved and often completely cured by the use of radium, but in cases of epitheliomata, especially soft ulcerous epitheliomata, the results are not so good. Ectodermic epitheliomata as a rule do not yield to radium or at least the result is doubtful.

While the general results of radium treatment are therefore encouraging, the clinical and histological data establishing the indications and contra-indications for its use require further investigation.

W. A. BRENNAN.

**Kernan, J. D., Jr.: A Case of Tuberculosis of the Sphenoid.** *Laryngoscope*, 1919, xxix, 276.

Kernan reports a case of tuberculosis of the sphenoid sinuses in a colored woman aged 31 who complained of prostration, chills, and fever, and pains radiating from the occipital region to the mastoids and later extending to the orbital regions. The patient had lost 20 pounds in six months.

Examination of the nose revealed disease of the right sphenoid. At operation friable granulation tissue was removed which proved to be tuberculous. Radical removal through the antrum relieved the symptoms.

O. M. ROTT.

## THROAT

**Cheatham, T. A., Jr.: Tonsillectomy—Indications and Contraindications.** *South. M. J.*, 1919, xii, 267.

Cheatham discusses the indications and contra-indications for tonsillectomy. The indications are: (1) chronic hypertrophy of the tonsils which interferes with phonation, deglutition, respiration, or audition; (2) repeated attacks of acute tonsillitis; (3) persistent glandular involvement following tonsillitis; (4) chronic caseous degeneration of the crypts; (5) recurring peritonsillar abscess; (6) chronic inflammation of adjacent tissues; (7) tuberculosis in which no contra-indication is present; (8) tumors; (9) focal infection; and (10) subnormality.

The contra-indications are: (1) normal tonsils; (2) hæmophilia; (3) the presence of epidemics, particularly those gaining entrance through the upper



respiratory tract; (4) anæmia; (5) acute purulent processes of the mouth, throat, nares, or accessory sinuses; (6) acute pulmonary tuberculosis; (7) acute febrile diseases; (8) acute surgical conditions; (9) infancy and old age, especially when less radical measures have not been tried; and (10) syphilis.

O. M. ROTT.

**Lewis, F. O.: Removal of Tonsils and Adenoids under Local Anæsthesia.** *Therap. Gaz.*, 1919, xliii, 328.

Lewis states the advantages of local anæsthesia as compared with general anæsthesia as follows:

1. With local anæsthesia there is less danger of starting up an old tuberculous lesion of the lungs which occurs so frequently when general anæsthesia is universally employed.

2. General anæsthetics have been known to produce nephritis, cardiac and respiratory failure, and insufflation pneumonia.

3. No cases of abscess of the lung have been reported following tonsillectomy under local anæsthesia.

4. It is available when general anæsthesia is contra-indicated as in chronic nephritis, respiratory disorders, pulmonary tuberculosis, etc.

5. Local anæsthesia has an advantage in the rapidity with which the operation may be done without the shock which follows a general anæsthetic.

6. When the case is uncomplicated, local anæsthesia is a time-saver and requires fewer assistants.

Local anæsthesia is contra-indicated in children under 10 years of age, in secondary operations, when there have been repeated attacks of peritonsillar abscess, and in highly neurotic adults or those with extremely sensitive throats.

One-half per cent novocain with 1 drop of 1-1000 adrenalin to each dram of the anæsthetic is preferred, one dram of the mixture being injected between the capsule and muscle of each tonsil. The same solution is used for adenoids.

O. M. ROTT.

**Gatewood, L.: A Simple, Safe, and Rapid Tonsil Enucleation Technique for Local or General Anæsthesia.** *Laryngoscope*, 1919, xxix, 285.

Through the loop of the snare the tonsil is grasped with an 8-inch curved mouse-tooth forceps the blades of which are about  $1\frac{1}{2}$  inches long. As much of the tonsil as can be grasped is included in the bite. The upper blade is fixed by firm pressure into the capsule, just below the superior angle of the converging pillars, and the lower jaw of the forceps is then pressed to the same depth, seizing the inferior reflexion of the capsule. The handles are then locked, sufficient pressure being used to prevent the dislodgment of the blades. The forceps are then drawn inward and rotated so that the convexity is inferior and serves for the tongue depressor which is now

discarded. A curved tonsil elevator is used to lift the anterior pillar from the tonsil. The elevator is introduced with the concavity facing the operator at the upper loose attachment of the pillar by gentle pressure. The mucous surface of the anterior pillar is undisturbed because the tonsil is dislodged from behind the anterior pillar by sliding the latter and its covering membrane away from the tonsil. The anterior margin of the capsule is now brought into view. The operation is completed with a snare shaped to cut from before backward. This is accomplished by using heavy No. 10 piano wire in an ordinary snare handle bent into a semi-diamond shape.

O. M. ROTT.

**Irish, H. E.: Retropharyngeal Abscess in Children; Diagnosis and Case Reports.** *Illinois M. J.*, 1919, xxxv, 227.

Irish discusses, with case reports, the diagnostic problems of retropharyngeal abscesses. In the first place, the attention is drawn to the position of the lymph glands back of the pharynx. Some are placed at the juncture of the posterior and lateral surfaces of the pharynx and at the apex of the lateral masses of the atlas. Usually they are two in number. In front they are in relation with the posterior wall of the pharynx; behind, with the rectus capitis anticus major which separates them from the lateral masses of the atlas; externally, with the constrictors of the pharynx and through the latter with the internal carotid artery; and internally, nearly 2 centimeters distant from the middle line.

The parapharyngeal glands are the superior glands of the internal jugular chain into which the vessels from the retropharyngeal glands empty.

To abscesses of the first group the term "retropharyngeal abscess" is applied and to those of the second group the term "parapharyngeal abscess."

The salient points in the diagnosis are:

1. An antecedent history of an inflammation in a tissue tributary to these glands.

2. The age of the patient is under 3 years as these glands usually atrophy at that age.

3. There may be an interval of apparent improvement after which the patient becomes progressively worse.

4. There is fever and leucocytosis.

5. The cry suggests the cry of a duck.

6. Dysphagia evidenced by aversion to swallowing food or drink.

7. Noisy mouth breathing and dyspnoea which is increased on lying down.

8. Hacking dry cough, also increased on lying down.

9. Head is held backward and erect.

10. The discovery of a swelling on inspection and palpation.

Emphasis is given to a proper technique in inspection and palpation. The technique advised is as follows: The child is seated on the nurse's knee with the arm nearest the nurse passed to her back. The nurse holds the child closely to her with one arm

with its face to the light, and with the other holds the child's free hand. The physician stands directly behind the child and grasps its occiput firmly in one hand to rotate or extend the head so as to bring it into the best line of vision or light. The other hand inserts the tongue depressor to the base of the tongue and makes a slight forward traction. The physician's gaze is directed from above and just under the upper incisor teeth to the pharynx. O. M. ROTT.

**Ramos, A.: The Treatment of Laryngeal Tumors with Radium** (Las aplicaciones de radium en los tumores de laringe). *Med. Ibera*, 1919, vii, 20.

For the treatment of laryngeal tumors the author uses 12 milligrams of radium bromide salt enclosed in a silver tube 1/10 millimeter thick with a lead filter 1 millimeter thick, the whole covered with rubber. The radium is introduced by the natural routes.

The region is anæsthetized with a 10 per cent cocaine solution. If the nasal fossæ are healthy and the tumor is lateral, the application is made by the fossa on the side of the larynx on which the tumor is situated. Otherwise, the other fossa is anæsthetized. The stylet, around which a piece of cotton soaked in the cocaine has been rolled, is pushed by the root of the naris as far as the posterior part of the pharynx. The palatal velum, the base of the tongue, and the laryngeal surface of the epiglottis are also anæsthetized.

By a series of manœuvres based on the technique of Jiminez Encima the radium tube is put into position and fixed through the mouth and naris. The author's custom is to place it at the level of the upper surface of the tongue when the lesion is endolaryngeal, and at the height of the palatal velum for pharyngeal tumors.

The transition from anæsthesia to sensibility under the action of cocaine is so slow in this region that the presence of a foreign body is well borne and the radium tube can be left in place for from four to eight hours. Treatment may consist of as much

as nine hours of radiation each day for five or six days. After an interval of twenty days another treatment is given if an examination shows it to be necessary.

W. A. BRENNAN.

## MOUTH

**Hartzell, T. B.: Discussion of the Factors to be Considered in Determining Whether to Extract or Conserve Diseased Teeth.** *Am. J. Surg.*, 1919, xxxiii, 97.

It is conceded by most pathologists that the majority of heart, joint, and kidney infections have their origin in the mouth. The streptococcus viridans has been isolated by numerous observers from the heart's blood and ulcerating surfaces of the hearts of persons who have died from endocarditis.

The author submits figures from the United States Bureau of Vital Statistics showing that the death rate from heart disease is far greater than that from tuberculosis. Heart disease is therefore a greater menace than tuberculosis, but to a very great extent is preventable by proper mouth sanitation.

The principal source of infection is the enormous growth of streptococcus viridans in the oral cavity and on tooth surfaces, whence it enters the circulation through pyorrhœa pockets, chronic dental abscesses, and tonsil crypts. Hartzell reports an interesting case proving these facts.

Recently there has sprung into being a great group of medical men and a few dentists who, to control the death rate from mouth infection, vigorously assail the conservationist and ruthlessly sacrifice many valuable teeth. The problem that confronts every man practicing medicine and dentistry is what to do with diseased teeth and under what conditions is the removal of necessary teeth justified in order to prevent greater ills than those which arise from the improper mastication of food.

M. N. FEDERSPIEL.



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# INTERNATIONAL ABSTRACT OF SURGERY

OCTOBER, 1919

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Kennedy, J. W.: Standardization of Surgery.  
*Am. J. Obst.*, 1919, lxxix, 759.

In the last 1,000 re-operations in abdominal surgery at the Joseph Price Hospital much that is reprehensible was discovered. In over 99 per cent of the cases there were adhesions to the scar or to the abdominal wall in the region of the scar. Adhesions in the region of the scar rather than to the scar itself, if not the result of stitch infection, must be due to the inclusion of some of the viscera by the terraced method of suture. Adhesions even more remote from the scar must be due, in large measure, to the traumatic use of the retractors.

In practically all of these outside cases the operations were performed by men who use gloves, catgut, the terraced method of suturing, and abdominal retractors. Not over 7 per cent of the author's patients who return for re-operation have had any adhesions to the scar or in the region of the scar. Gloves, catgut, the terraced method of suturing, and retractors are not used. The 1,000 re-operations in abdominal surgery included also the usual number of other procedures. The group of cases which showed the greatest percentage of operative failures and returned for re-operation were those in which plastic surgery had been performed. Over 85 per cent of the patients who had perineal and cervical repairs had had previous repairs which were failures. The terraced method of suturing with catgut had been done in nearly all cases by practically all the more recent methods. The author never uses catgut in surgery and never repairs the perineum by any of the more modern methods of terraced suturing.

The percentage of permanent successes should be larger in repair work than in any other branch of surgery. The catgut suture and terraced method of suturing by the overcurved needle which includes insufficient tissue are responsible for practically all the failures. The straight needle, which includes nearly 100 per cent of the tissues when inserted at

right angles to the surface, is the secret of success, and when threaded with silkworm gut gives no chance for failure. That plastic surgery is a lost art is indicated by the great number of operations which have been devised and their failure. Emmet and Haeger remain supreme. The only failures which are possible in the procedures recommended arise from misunderstanding or inability to perform the operations.

Another large group of patients returned for re-operation because of incomplete surgical procedure for the removal of tubal and ovarian infections. In all of these the operation could and should have been completed in the first instance. Cases in which there is vaginal puncture constitute some of the most difficult of surgery. The author knows of no legitimate place in surgery for vaginal puncture. In the re-operations following gastro-enterostomy during the last two years he has undone more gastro-enterostomies than he has done.

Kennedy finds himself less able to cope with those cases in which there are symptoms following the removal of the gall-bladder. These are improved little, if any, by re-operation.

In the author's opinion too many gall-bladders are removed. When surgeons learn the superior use of gauze as a pack in draining the gall-bladder they will remove gall-bladders less frequently and will learn also that after this more thorough method of drainage the gall-bladder will often function.

The large group of patients who come for re-operation following ventral fixation or suspension often have the most severe pathologic conditions of which the author has knowledge.

In an attempt to standardize the procedures for which multiple operations are being done—such as twenty or more methods of shortening the round ligaments and thirty or more operations for repair of the perineum—their multiplicity may be condemned for two reasons, i. e., the operation is either not indicated at all or is based upon a doubtful surgical foundation.

EDWARD L. CORENLL.



**Le Maitre, F.:** *The Conception of Regional Surgery as Filling in the Gap Between General and Special Surgery.* (Conception d'une chirurgie régionale destinée à prendre place entre la chirurgie générale et la chirurgie spéciale). *Rev. maxillo-faciale*, 1919, iii, 305.

Between the surgery of the specialties, which is too limited to deal with all lesions, and general surgery, which is too broad to deal with the refinements of the special branches, there is a field which should be recognized as that of regional surgery. This regional surgery is related to special surgery in that it recognizes its particular methods and its special technique. On the other hand it adopts the broader principles of general surgery and applies them not to one or two organs alone but to the entire region.

There are many points in which general surgical principles must be modified when applied to the head and neck. Le Maitre, however, desires to refer only to three fundamental principles which are based on the special anatomy of the face: (1) illumination; (2) the use of the natural passages as avenues of surgical attack as well as for drainage; and (3) the question of local anaesthesia.

A regional head surgeon should be well trained in the use of the electric head mirror.

There are certain deep-seated localities such as the pterygomaxillary fossa, zygomatic region, etc., which can be approached by the natural passages. A surgeon who uses the cutaneous route when he should make use of a natural passage is not a true head surgeon.

There are special methods of inducing regional anaesthesia such as that of laryngotomy between the cricoid and thyroid cartilages. This method also has indications in facial surgery. However, while it is easy and safe, it should be reserved for only the most serious cases.

W. A. BRENNAN.

**Farr, R. E.:** *The Transrectus Incision in the Upper Abdomen.* *Minnesota Med.*, 1919, ii, 176.

The proper performance of an intra-abdominal operation demands an incision through the abdominal wall of sufficient length to allow the surgeon to do his work insofar as possible unhampered by the interference of the abdominal parietes. During recent years long incisions have been made with less hesitancy and with a corresponding improvement in surgical therapy. Nevertheless, every effort should be made to conserve the abdominal parietes to an extent commensurate with the handling of the intra-abdominal problem.

Regarding the direction of incisions, structures to be conserved, etc., certain usages have become established. The points for consideration are: (1) the appearance of the resultant scar; (2) the relative importance of the division of muscular as compared with aponeurotic tissue; (3) conservation of the blood-supply; (4) conservation of the nerve supply; (5) anticipated pathology; (6) the facility with which the incision may be made and closed;

and (7) the relaxation afforded during operation and after operation.

While the appearance of an abdominal scar is relatively unimportant, it does make a difference and it is desirable that an incision be placed so that the scar will be as slightly as possible. The most slightly scars are those of incisions along Langer's lines.

Two main objections are made to the division of the rectus muscle: (1) it is said that it retracts between the anterior and posterior sheaths and cannot be re-united unless some method is used to prevent this retraction, and (2) the hæmorrhage is troublesome and is somewhat hard to control as it comes directly from the cut surfaces of the muscle. Many surgeons suture the rectus muscle to its sheath for the purpose of preventing retraction, but the author believes this is unnecessary though for the purpose of hæmostasis it may be desirable. He has found that when the incision strikes a linea transversa there is no retraction. If the incision goes through the red muscle, however, there is some retraction, the degree depending upon its distance from a linea transversa. A proper closure of the sheaths of the rectus (aponeurosis) has always resulted in an intimate contact of the divided ends of the muscle.

In the presence of a sufficiently free anastomosis, the division of the blood-vessels is relatively unimportant. Even with division of the main blood-supply, incisions through extremely vascular areas heal with great rapidity.

Unless made with extreme care the pararectal incision must destroy one or more of the nerves which are regarded by many authorities as the most important structures in the abdominal wall. Atrophy then unquestionably results. Quain shows that visceroparietal adhesions are more prone to develop when the nerves of the abdominal wall have been divided.

Above the navel the transverse incision offers the most adequate exposure of the various pathologic conditions, and by supplementing this incision with the near-midline vertical incision when necessary, one is afforded perhaps the most ideal exposure it is possible to obtain. In the matter of choosing incisions a great deal can be done by varying the size and direction according to the pathology anticipated.

All authorities agree that it requires more time to enter the abdomen by the transverse route. In closing, however, the relaxation afforded by the proper posture of the patient makes it possible to unite the edges of the transverse cut in a relatively short time. When the vertical cut is added, the strong lateral pull is at once encountered and the problem becomes more difficult. The transverse incision always comes together more easily than the vertical.

Greater accessibility may be obtained through the transverse incision than through a vertical incision of equal length, and there is less postopera-



tive discomfort. This is probably due to two factors: (1) the better exposure afforded by the transverse incision which allows the surgeon to do his work with less trauma; and (2) the fact that the line of incision may be relieved of tension to some extent by having the patient assume a proper posture.

Generally speaking, the gall-bladder is exposed by a division of the right rectus muscle above the navel. The stomach is exposed by a division of the left rectus. With either of these incisions we go across the linea alba. If the disease lies high, the incision may be supplemented by a vertical limb which may be extended to the ensiform if need be. In making the latter, the linea alba is avoided as a matter of preference the anterior sheath of the rectus being divided first and then the posterior sheath from  $\frac{1}{2}$  to 1 inch from the linea alba.

P. H. KREUSCHER.

**Arce, J.: The Star Incision in Operations on the Upper Abdomen** (La incision estrellada en las intervenciones del abdomen superior). *An. d. Inst. mod. de clin. med.*, Buenos Aires, 1918, iii, 221.

The McBurney incision has an unquestionable advantage in the fact that after the skin and cellular tissues are incised the muscle planes are traversed by separation of their fibers rather than cutting.

In operations on the upper abdomen the author uses an incision similar to the McBurney incision which he calls a "star" laparotomy. The technique of this operation is as follows:

1. A transverse skin incision is made from a point the width of two fingers outside the median line to the axillary line, a little beneath the costal border, and running approximately 2 inches above the umbilicus.

2. When the skin and cellular tissues are incised, the fibers of the obliquus major are separated as widely as the wound will allow and down to the external edge of the abdominal rectus. The fibers of the obliquus minor seen through the lower border of the aperture of the obliquus major are also separated in all their visible extent until the external border of the rectus is reached where the separation of the obliquus major terminates.

3. The anterior part of the rectus is sectioned transversely and the rectus muscle pulled back with a Faraboeuf separator.

4. The transverse muscle and the posterior part of the rectus, together with the peritoneum, are then sectioned.

According to Arce this technique with the free use of retractors permits the surgeon to see the duodenum, the hepatic angle of the colon, the kidney, gall-bladder, and bile ducts. It also allows operation upon these organs as well as those for cysts and abscesses of the upper and lower surfaces of the liver.

To close the wound, the posterior part of the sheath of the abdominal rectus and peritoneum are sutured in one plane of the transverse muscle. This

suture is simple when compared with that of the deep planes in vertical incisions. The rectus muscle is replaced in its position and the obliquus minor sutured as far as the external edge of the sheath of the rectus. The anterior part of the rectus is then closed, the suture being continued into the obliquus major.

The author has performed 24 laparotomies with this technique and has been fully satisfied with the results.

W. A. BRENNAN.

**Sistrunk, W. E.: Practical Considerations with Regard to Permanent Colostomies.** *Surg., Gynec. & Obst.*, 1919, xxviii, 436.

Nearly every type of colostomy that has been suggested and seemed practical has been used in the Mayo Clinic but up to the present time operations or procedures undertaken with the idea of giving the patient control of the bowel have almost always proved disappointing.

Many of the colostomies were entirely satisfactory; in a few there was a tendency toward the development of a ventral hernia about the colostomy. More frequently, however, the tendency has been toward retraction of the loop of bowel in which the colostomy was made, which in some instances allowed the proximal end to discharge a part of its contents into the distal end. Also when the bowel was cut off at or near the level of the skin, the skin tended to contract around the opening of the bowel and thus interfere with the discharge of feces.

The author describes the colostomy he is now making, which is similar to the operation described by Mixer. The incision is a low left rectus incision of sufficient size for abdominal exploration. The colostomy is made in a loop of the sigmoid flexure, this portion of the bowel being chosen because of its mobility and length of mesentery. After the loop has been lifted out of the abdominal cavity, an incision  $1\frac{1}{2}$  to 2 inches in length is made through its mesentery parallel with the vessels and extending upward nearly to the bowel. A second incision, about 1 inch long, is then made across the end of the first incision near the mesenteric attachment of the bowel, forming a good sized opening in the mesentery through which the two sides of the abdominal wall near the center of the incision are sutured beneath the loop. The remaining portions of the wound are then closed.

To relieve gas distention, a small opening may be made in the bowel if necessary any time after twenty-four to forty-eight hours, and in from five to six days the bowel is cut completely across with the cautery. After the loop has been cut across it will be found that the two ends of the bowel are separated by the entire abdominal wall for a distance of from 1 to  $1\frac{1}{2}$  inches, and the cut ends of the bowel protrude an inch or more above the skin.

The operation described has obviated some of the difficulties which have often followed other types of colostomies.

V. C. HUNT.



**Gross, G.: Primary Suture of War Wounds.** *Surg., Gynec. & Obst.*, 1919, xxviii, 603.

Early in the war expectant treatment of wounds was the rule. This gave way later to the use of large open incisions with adequate drainage, and from the disadvantages of this grew the practice of complete excision with primary closure.

In deciding upon primary suture three points were considered: (1) the length of time since the receipt of the injury, (2) the anatomical possibility of completely excising the wound, and (3) the favorable or unfavorable general aspect of the wound as regards primary re-union. When primary closure was not advisable careful antiseptic management controlled bacteriologically for from fifteen to twenty days was followed by secondary suture.

War wounds may be infected by purulent organisms alone, such as the staphylococcus or the streptococcus, or both, or by saprophytic anaerobes which thrive in the presence of bruised or bloodless tissue and whose activity depends largely on the types of aerobic organisms associated with them.

In order to arrive at a prognosis and determine the operative course, the nature of the infection must be established. In general, primary suture should be tried as a matter of course if complete debridement has been done. If the staphylococcus is present in the primary discharge local drainage should be instituted when necessary. If the streptococcus develops, the wound should be opened widely. If anaerobes appear (usually not before thirty hours), all recesses should be freely exposed.

When primary suture has not been done, the surgeon should effect a secondary closure as soon as possible, being guided only by the nature of the aerobic organisms. The streptococcus alone contra-indicates primary suture.

The following points should be observed in order to understand the technique of primary suture:

1. The progress of sutured wounds. A large percentage of sutured wounds heal by primary intention. The stitches are removed after ten days and the patients evacuated as cured on the fifteenth or twentieth day. There is a reasonable absence of pain and general reaction in this group of wounds when primarily closed, even when they are very extensive in size. In a certain group of cases, however, there is slight fever, a slight redness and tension about the stitches, and often a few drops of pus. This condition subsides and healing is delayed only a little. In a small group (5 per cent of cases) the temperature rises 2 or 3 degrees for several days, the entire wound is swollen and painful, and when a small opening is made with the forceps between the stitches a little bloody fluid containing a few gas bubbles escapes. Further progress is uneventful. In still other cases the entire vicinity of the wound is swollen and tense, and a cherry-red color extends upward and downward. Often with evidence of gas beneath the suture an unpleasant odor is detected. This angry condition subsides as a rule without producing general symptoms providing the streptococ-

cus is not present. Sometimes there is a little supuration and the formation of a gas abscess which must be opened. When a streptococcus infection is present, however, the picture is quite different. The expression is drawn, the temperature high, the pulse rapid, the pain severe, and the region of the wound a deep red in color and mottled. These wounds must be opened at once as widely as possible. All such cases should be isolated.

2. How to determine the presence of the streptococcus. Primary suture is done under bacteriological control. Smears are taken by pipettes from all recesses of the wound between the tenth and eighteenth hour after injury. Inoculations are made in broth, on slanted agar with litmus and lactose, and into deep agar of Veillon. Egg albumen with soda or ascitic fluid when added to the broth facilitates the growth. Within four to six hours the streptococci may be identified. In very recent wounds only 10 to 15 per cent show the streptococcus alone, while in only 6 to 8 per cent are the anaerobes seen in association with it.

3. The technique to be followed to obtain constant results. First, excise the entire wounds of entrance and exit. Do not explore the track with the fingers or a probe. Practise wide excision, layer by layer, until all remaining tissues bleed, are contractile, and have a healthy color. In cases of fracture be satisfied with the removal of all free splinters which are not adherent and foreign bodies. If the projectile is embedded in a diaphysis or an epiphysis, the area should be hollowed out, laid flat, and touched with iodoform ether. It may then be filled in different ways. In cases of injured joints, primary resection, typical or atypical as needed (after the manner of Loubat) should be done. As antiseptics ether is best for the soft parts, and ombredanne and iodoform-ether for bone injuries. In closing the wound hæmostasis should be complete and the formation of spaces avoided.

4. The time for suturing. Primary suture should be done if no streptococcus is found and there is no anatomical or pathological contra-indication. Close practically every wound upon the patient's arrival, re-opening those in which the streptococcus has been found. Suture is contra-indicated in: (1) multiple wounds, when shock prevents extensive operation; (2) deep wounds which are infected and cannot be completely excised; (3) wounds containing large projectiles; (4) wounds producing extensive injury to the skin; and (5) wounds not requiring suture (enucleation of the eye).

The advantages of primary suture are unquestionable. The period of suffering is shortened. The danger of secondary infection is obviated. Functional restoration is obtained more quickly. A flexible, non-adherent scar is not likely to become malignant. Fewer attendants are necessary. The time of disability, even with extensive wounds, is much shortened.

The requisites for constant results are: a competent surgeon, a competent bacteriologist, and con-



trol of the wounded at least fifteen days to allow primary healing.

The work of Tossier, on which all wound closures are now based, permitted the greatest progress in surgery realized during the war. E. M. MILLER.

**Le Fur, R.: Eighty-Two Cases of Primary Suture** (Sur 82 cas de sutures primitives) **Ten Cases of Primary Suture of the Joints** (Dix cas de sutures primitives articulaires). *Paris chirurg.*, 1918, x, 400, 455.

In the 82 cases of primary suture of war wounds reported by Le Fur the indications for this procedure were given by the nature of the wound, its clinical aspect, its recent date, and the results of bacteriological examination.

Total suture was done in 14 cases; in 62 filiform drainage was necessary.

A successful result was obtained in 70 cases. The 14 total primary sutures all resulted successfully; of the 62 wounds which were drained the results were successful in 52.

Thirty-one of the wounds were bullet wounds and 51 shell wounds. The results of primary suture were successful in six-sevenths of the bullet wounds and four-fifths of the shell wounds. Twelve wounds were wounds of the head and neck, 30 of the upper limb, 29 of the lower limb, and the balance multiple wounds. The 12 face and neck cases gave 11 successes and 1 failure; in the 30 wounds of the upper limbs there were 28 successes and 2 failures; and in the 29 wounds of the lower limbs, 25 successes and 4 failures.

The wounds which were sutured within the first twenty-four hours after the injury gave 90 per cent successful results; those sutured within thirty hours, 88 per cent successful results, and those sutured within forty-eight hours, 85 per cent successful results. Suture after forty-eight hours gave 71 per cent successful results.

In the whole series of 82 wounds, many of which were very extensive and 13 of which were complicated by fracture, there was not a single fatality. In only 12 cases was re-opening necessary owing to infection. The author points out also the superiority of primary suture from the point of view of function. The cicatrices are soft and supple and there is no stiffness of the joints nor any complication in the muscles or tendons. In addition, recovery is far more rapid than following other methods of closure.

In his special report regarding primary articular sutures Le Fur treats of 3 elbow, 1 shoulder, and 6 knee-joint cases. Four were complicated by fractures. From the results in this series he draws the following conclusions:

1. In cases of joint wounds it is always more prudent and often necessary to open the articulation by a wide arthrotomy and to disinfect it thoroughly.

2. The disinfection and cleansing of the joint should be carefully done and complete. The arthrotomy should be large enough to expose the whole wound track, the synovia, the cartilage, and the

bone regions, and to permit the removal of every particle of debris. The interior of the joint should be washed with ether.

3. Unless contra-indicated, the suture of the joint should be complete and a drain should not be used. The harm of drainage in joint wounds has been fully demonstrated. Drains favor infection and cause ankylosis. When drainage is necessary (as in purulent arthritis), however, the small Dakin drains should be used with continuous or interrupted irrigation with the Dakin fluid. These drains should be changed every day or every other day.

Le Fur believes that as a rule physiotherapy is delayed too long in articular injuries. In the cases in which he did a primary suture it was generally begun by the twelfth or thirteenth day.

W. A. BRENNAN.

**Stoney, R. A.: Secondary Suture of Wounds.** *Lancet*, 1919, cxcvi, 978.

The author outlines his method for secondary suture of wounds as follows: After thoroughly cleansing the wound with ether and iodine, the granulation tissue is removed with a sharp curet, the skin edges are separated by blunt dissection around the wound for a considerable distance, and this loose skin edge is removed. This having been done, the whole wound is thoroughly dried and the bleeding points securely tied. The wound is next swabbed with ether, packed for a few moments with gauze wrung out of ether, and then completely covered with a modified "bipp" composed of two parts of iodoform, one part of bismuth, twelve parts of vaseline, and enough hard paraffin to give the preparation the consistency of butter.

The tissues are sutured in layers with catgut, all dead space being obliterated, and finally the skin is united by thick silk impregnated with the paste described.

If there is no continued rise of temperature or pain after the operation the wound need not be dressed until the seventh or eighth day. In the majority of cases, however, there is considerable tension, and dressing is done on the fourth day. The author has found it advisable to keep the edges approximated by strapping for a period of a week or ten days after the removal of sutures.

The article contains a tabulation of cases treated by this method.

D. C. BALFOUR.

**Butchel, F. C.: The Use of the Cautery.** *Colorado Med.*, 1919, xvi, 144.

The uses of the hot iron in surgery are reviewed briefly. There are three groups of indications, malignancy, the prevention of infection, and the prevention of hæmorrhage.

In cases of malignancy the cautery has been found especially useful in the treatment of tumors of the jaws and uterine cervical, breast, and vesical carcinoma.



In the prevention of infection it is used for the destruction of gastric ulcers, the sterilization of appendiceal and cholecystectomy stumps, the sterilization of the cervical canal in supravaginal hysterectomy, gonorrhœal endocervicitis, and cervical ulceration, the treatment of noma, and, in the war zone, the treatment of recent wounds. Pancreatic fistulæ, corneal ulcers, and tonsillar infections have also been attacked successfully in this manner.

In the prevention and arrest of hæmorrhage the cautery has been employed in prostatectomy and the removal of nævi.

K. L. VEHE.

**Madero, G.: Some Psychic Cases Improved by Surgical Operation** (Sobre algunos casos de psiosis mejorados con la intervención quirúrgica). *Rev. Asoc. méd. argent.*, 1919, xxx, 276.

Madero reports the cases of three women, inmates of a hospital for the insane, who showed distinct improvement after surgical operation. The first was a case of acute appendicitis and uterine lesions. The appendix was removed. The second patient had an abdominal tumor and was subjected to a cholecystectomy. In the third case the operation consisted in opening and draining an abscess in the region of the thigh. Following the operations there was a decided improvement in the patients' mental state as well as in their general condition. This mental improvement was observed shortly after operation when the disturbance due to the operative traumatism had subsided. The patients became tranquil, delirium ceased, and there was co-ordination of thought. The psychosis in these cases was the result of chronic infectious processes of slow evolution which had periods of acute exacerbation and had left a permanent effect on the mind.

True infectious delirium is manifested in the septicæmias, typhoid, etc. and is secondary to a general infection, disappearing with it. Other types of delirium may be more permanent and maintained as permanent psychoses after the acute infectious stage has passed until the organic disease disappears and the general health is restored.

W. A. BRENNAN.

**Pringle, J. H., and Teacher, J. H.: The Digestion of the Œsophagus as a Cause of Postoperative Hæmatemesis.** *Brit. J. Surg.*, 1919, vi, 523.

Postmortem digestion of the Œsophagus is recognized as an extremely common condition but œsophageal digestion during life has been considered extremely rare.

The authors' first case was that of a well-built, well-nourished youth who died about ten hours after an appendicectomy. The abdomen showed no lethal pathology, but destruction of the lower part of the Œsophagus, the presence of slate-colored fluid in the pleural sacs, congestion and hæmorrhage of the lungs in the neighborhood of the Œsophagus, and interstitial emphysema were found.

Fifteen cases which came to autopsy and in which it seemed very probable that digestion of the

œsophagus had occurred during life are reported.

The pathology in these cases varied from dilatation of the œsophagus just above the diaphragm by a thin black fluid associated with superficial ulcerations and hæmorrhages into the œsophageal wall, to deep and widespread ulceration with perforation and reaction in the adjacent pleura and lungs. In every instance there was a sharply defined ulceration of the mucous membrane at the very termination of the œsophagus, and when perforation had occurred, it was always found low down in the tube.

The hæmorrhages in this condition are of varying extent, submucous and intramural. Over these the membrane may be intact, or it may show superficial disintegration with widespread erosions or deep ulceration. The authors believe that the hæmatemesis is explained by the erosions over and around the hæmorrhages. The digestion of the devitalized coats they ascribe to the escape of the gastric juice into the œsophagus during the course of a toxic disease.

In cases of hæmatemesis there is often a state of profound toxæmia and the mortality is very high. The amount of blood vomited is usually small but in some instances is large. As a rule the fluid ejected is extremely acid and in many cases it has a scalding effect on the throat and lips. Often also there is a boring retrosternal pain. Usually the hæmatemesis begins soon after operation.

The authors conclude: (1) that digestion of the œsophagus may occur during life and cause hæmatemesis; (2) that this digestion may occur in the course of any disease which greatly lowers the vitality; and (3) that antemortem digestion of the œsophagus is one cause of postoperative hæmatemesis.

K. L. VEHE.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Henderson, J. M.: The Carrel-Dakin Treatment in Empyema at Camp Custer, Michigan.** *North-west Med.*, 1919, xviii, 101.

The author summarizes his article as follows:

The Carrel-Dakin treatment of wounds may be successfully employed in empyema and is a most valuable method.

The best results were obtained in acute cases in which costectomy was performed and a limiting membrane had formed. In such cases an opening was made sufficiently large to allow the introduction of from four to eight Carrel tubes.

The average acute cases can be sterilized in from six to ten days and the wound successfully closed by sutures or allowed to close spontaneously.

From the beginning there is complete absence of odor, the pus disappears very rapidly, and the patient's general condition shows marked improvement.

The treatment of the delayed cases consisted of opening the pockets when possible or enlarging the sinus sufficiently to introduce the tubes, complete or partial sterilization of the cavity or old sinus with



Dakin's solution, and the introduction of Beck's paste.

The treatment of the cases of large pneumothorax consisted in sterilization of the cavities with Dakin's solution and the subsequent sealing of the wounds. The author believes that the first end to be attained is the sterilization of the cavity as he considers that there is more to be feared from the toxæmia than from the pneumothorax. It is impossible, however, to lay down any fixed rule that is applicable to all cases. Each must be considered a problem by itself and the treatment modified accordingly.

E. C. ROBITSHEK.

### ANÆSTHETICS

**Vitrac: General Ether Anæsthesia by the Rectal Route** (Anesthésie générale par l'éther administré par la voie rectale). *Bull. et mém. Soc. de chir. de Par.*, 1919, xiv, 934.

Vitrac's report is based upon the observation of 67 cases of general ether anæsthesia induced by the rectal route with ether-oil. The results obtained seemed to demonstrate that the injection of ether-oil has only a weak anæsthetic value. Sleep was perfect in only four-tenths of the cases, imperfect in five-tenths, and quite insufficient in the remainder. In the cases in which the anæsthesia had to be completed by inhalations, the quality of the narcosis was much better than when the anæsthesia was produced by inhalations alone. Only in favorable cases was the anæsthesia quite sufficient for all operations.

This form of narcosis is followed in a few hours or days by vomiting or abdominal pain. While these are not of great importance, the abdominal pain may continue for from one to twenty-four hours. In very rare instances pulmonary or hæmorrhagic complications develop.

Pulmonary complications in the form of pneumonia occurred in the cases of two men who were suffering from old pleurisy. In these instances the pneumonia was not serious and the author believes it may have been due to the operation rather than the narcosis. The most severe complication noted by Vitrac was hæmorrhage of the digestive tract which also occurred in two instances. One of these patients died.

Fifteen of the operations performed were on the thorax. Of these, 5 were for the extraction of foreign bodies and 10 were extensive thoracectomies. There were 10 excellent results, 2 cases of pneumonia, 1 case of excessive vomiting, 1 case of sharp pain, and 1 death. Four of the operations were performed on the head and neck. In 3, good results were obtained but in 1 there was pulmonary hæmorrhage. Two operations were upon the abdomen. The anæsthesia was perfect but the operation was interrupted by hæmatemesis. Two pelvic operations gave good results. In addition, there were 11 operations on the upper limbs and 22 on the lower limbs.

In the whole series of 67 cases there were 2 severe

complications in cases in which it seemed there were the most definite indications for the operation.

In commenting on Vitrac's report Wiart pointed out that in 500 operations performed in the United States by this method there was only 1 death; in Russia where it was used extensively the statistics of 1,500 cases showed 6 deaths and 7 severe complications, but it is by no means certain that the majority of the deaths were due to the anæsthetic.

The complications may be divided into two classes: (1) those due to heart failure, and (2) those due to intestinal hæmorrhage. The first appear to follow the use of too much anæsthetic, especially in the cases of very susceptible patients. While Gwathmey and Sutton in the United States do not consider the objections raised against ether-oil anæsthesia of much account, they tacitly admit the dangers of an overdosage of ether since they tell how the quantity of the dose may be diminished.

The impression gained from the facts reported is decidedly unfavorable to the method. It is not superior to others and seems much more dangerous. No other method has given the proportion of 8 deaths and 8 cases of severe complications in less than 2,500 cases. Until these complications have been fully explained as due to negligence or some technical error which is avoidable, rectal anæsthesia as practiced now must be classed as unquestionably dangerous and its use should be discontinued.

W. A. BRENNAN.

**Compañ, V.: Anæsthesia in Surgery of the Urinary Tract** (La anestesia en cirugía urinaria). *Rev. españ. de cirug.*, 1919, i, 222.

Compañ's paper was presented to the National Congress of Medicine, Madrid, April, 1919. His conclusions are:

1. Patients with urinary conditions are in a special class as regards physiological resistance and in surgical operations upon them the dangers of anæsthesia should be reduced to a minimum.

2. The number of cases in which general anæsthesia is used should be reduced to the lowest limits. Among the various general anæsthetics, ether is the best. The anæsthesia should be begun with a mixture of ether and chloroform. Ethyl chloride is preferred for short operations.

3. High epidural anæsthesia, although little employed up to the present time, merits attention as it easily and sufficiently anæsthetizes the pelvic organs so as to permit any kind of operation on the urinary tract. The Gil-Vernet method is the method of choice.

4. Local anæsthesia—either the method of Hackenbruch or the infiltration method of Reclus-Schleich-Braun—is the method of choice in urologic conditions. This has the least danger for the patient and is followed by an uneventful postoperative course whereas when other methods are used complications and even death may occur.

5. In operations upon the kidney and ureter the method of Schellheim-Kappis is of value in simple



cases; general anaesthesia is preferable in the majority.

6. Operations upon the urethra, prostate, and bladder should be performed as a rule with the aid of local anaesthesia induced by nerve blocking around the operative region or infiltration. In prostatectomy the author prefers Legueu's technique.

7. Novocaine with adrenalin is the anaesthetic of choice for local anaesthesia. W. A. BRENNAN.

**Miller, J. A.: Secondary Suture and Skin Graft under Local Anaesthesia.** *N. York M. J.*, 1919, cix, 770.

The chief advantages of early secondary sutures in the treatment of war wounds were, first, that the patient was made fit months sooner; second, that the dressings were done away with almost entirely for in absolutely successful cases only two dressings were necessary; and third, that the beds were ready for new patients in a shorter period. It therefore, preserved man power, reduced labor, and saved money.

Three of the author's chief reasons for doing secondary suturing of wounds under local anaesthesia were: (1) that while the wound was often ready for resuture, the patient, owing to gas poisoning, bronchitis, cardiac trouble, or poor general condition, was not able to take a general anaesthetic without risk to his impaired health; (2) that most of the men operated upon under local anaesthesia

preferred it; and (3) that in the average base hospital there was a shortage of medical officers and local anaesthesia disposed of the necessity for an anaesthetist.

Excessively large and deep wounds could not be treated by this method, but these types of injuries were comparatively few among the cases coming under the author's care. When it was impossible to attempt secondary suture because of a great loss of skin, Miller resorted to skin grafting, using the same principles and performing the operation under local anaesthesia with excellent results.

Two days prior to the operation, the wound was dressed with gauze moistened with a 25 per cent solution of magnesium sulphate. At the time of the operation care was taken to wash all of the magnesium sulphate away from the wound with sterile saline solution before proceeding with the sterilization and anaesthetization of the part. Miller used chiefly 2 per cent novocaine or 2 per cent eucaine to which were added about 15 minims of adrenalin to the 4 ounces at the time of using. He infiltrated the entire circumference of the wound superficially and deeply and under the granulation tissue covering the wound. The needle penetrated from the surrounding edges which had already been anaesthetized.

In the cases of skin grafting, the entire area of skin was anaesthetized intradermally instead of subcutaneously. E. C. ROBITSHEK.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Barnhill, J. F.: Surgery of the Trifacial Nerve.** *Laryngoscope*, 1919, xxix, 342.

Since the gratitude of the patient is often modified by the amount of scar left by an operation, it is essential to adopt a method that will insure a minimum amount of deformity.

Failure to diagnose the seat of the lesion in neuralgia accurately accounts for failure to cure by surgical methods. Undoubtedly it is a fact that a portion of a nerve trunk may remain intact and its branches continue to be actively neuralgic after apparently extensive operations in which the resection has not been carried to a sufficient depth. The branches of adjacent trunks of the trifacial overlap like the terminal branches of the infra-orbital, nasal, and infratrochlear nerves, making diagnosis of the exact branch very difficult.

The author favors surgery of the ophthalmic branch and its divisions earlier than operation upon the two others because of the probability that injection methods will fail to cure or relieve and the facts that the operation causes almost no scar and this branch is comparatively easy to deal with.

As the continuance of an unbearable neuralgia of the ala of the nose and the upper lip in recurring cases

indicates that the nasal nerve has not been extracted, the writer devised a procedure according to which an incision is made from the juncture of the outer and middle thirds of the supra-orbital margin well down on the bridge of the nose through the periosteum. The latter is detached cautiously toward the apex of the orbit until the anterior ethmoidal foramen is reached when the nerve is twisted out deeply enough to include the infratrochlear branch.

To effect a cure the infra-orbital nerve must be severed at the foramen rotundum. To accomplish this the author uses the transorbital route, chiseling away the osseous roof of the canal and avulsing the nerve at the round foramen, the orbital contents being held out of the way.

The transorbital operation has an advantage in that it does not open the antrum. A darkened room, good reflected light, and trained assistance are essential.

Experiments on the cadaver show that without chiseling into the canal and loosening the nerve the latter invariably snaps at the entrance owing to the large amount of connective tissue which binds it just within the foramen.

Return of neuralgia due to re-union after resection of 25 millimeters of the infra-orbital and infradental nerves has been reported and it is therefore believed





Fig. 1.



Fig. 2.



Fig. 3.

Fig. 1. The first step in the operation consists in the removal of the two wedge-shaped pieces from the floor of the nostrils to permit correction of the nasal deformity.

Fig. 2. First suture.

Fig. 3. Tension sutures of silkworm gut. (Brophy: Harelip).

by many that the gasserian ganglion should always be attacked. The best procedure is stated to be section of the sensory root as advocated by Spiller as this gives permanent relief. No attempt being made to remove all or a greater part of the ganglion, the danger of injury to the cavernous sinus is decreased.

S. S. HOWE.

**Brophy, T. W.: Harelip.** *Surg. Clin. Chicago*, 1919, iii, 265.

The case demonstrated by Brophy is that of a so-called partial double harelip. There is a separation of the lip in two places, extending about half-way between what should be the vermilion border and the nose. There is also a complete cleft of the palate and a separation of the alveolar process on the left side. The right side is intact. This particular condition is comparatively rare.

The operation for the repair is performed under ether anæsthesia. As the nostrils, especially the left one, are wider than normal, a wedge-shaped piece of tissue is removed at the lower gap so as to contract them. The lip is picked up and a flap made by passing the knife obliquely upward through its entire substance as far as the incision just made. In this way the abnormally dilated nostril is reduced. The procedure is the same on the opposite side except that the piece of tissue removed need not be so wide.

The first consideration is to get the nostrils right, and the second to close the fissure in the lip. In order to avoid a depression in the lip its tissues are split so as to roll out the skin and make it thicker at the border. Any superfluous mucous membrane is then taken off so that the mucous membrane will not overlap the skin or the skin overlap the mucous membrane. Skin is now carefully sutured to skin and mucous membrane to mucous membrane with horsehair. One or two stay sutures all the way across are then inserted to hold the parts together.

Before making the first incision, the nose is closed to exclude blood from the nasal passages. However, as it is extremely difficult to prevent the escape of

some blood into the passages above the tampon, Brophy advises washing out the stomach at the completion of the operation in order to get rid of all that has been swallowed. In this way an increase in temperature from the absorption of blood in the stomach is avoided.

The dressing consists of strips of adhesive plaster placed on the face in such a way as to leave the wound open as much as possible. Cuffs of cardboard are put on the child's arms to prevent it from sticking its fists into its mouth. A piece of iodoform gauze is placed in the nose for two or three days to exclude excretion from the stitches. After the gauze is removed, the nose is kept clean with an applicator.

**McCauley, D. H., and Worthley, B. L.: The Treatment of Ununited Fractures of the Jaws. Résumé of Work Done by the Dental Department, U. S. A. General Hospital No. 11, Cape May, N. J.** *Dental Cosmos*, 1919, lxi, 455.

In this article, which is a continuation, the authors report the following conclusions regarding the treatment of ununited fractures associated with a large loss of bony substance.

1. Wiring teeth is contra-indicated except as a temporary measure.

2. An interdental splint should always be used in fractures of the mandible when there is a large loss of bony substance and especially when only the molars can be used as points of fixation and when the injury is posterior to the last tooth.

3. The pin-and-tube type of interdental splint has advantages far superior to any used heretofore.

4. The jaws should be placed in the position of rest when the fracture is anterior to the angle.

5. When there is destruction of at least half the ramus, only fibrous union can be secured.

6. In the great majority of mandibular fractures associated with loss of substance the posterior fragment should be drawn forward.

7. When a compound comminuted fracture is present at the median line, springiness will often



occur even after primary union has taken place and an apparently perfect result has been obtained. This springiness permits the two bodies of the mandible to swing inward, causing mal-occlusion. In these cases permanent support should be given by fixed bridge work.

8. Immobilization of the jaws alone will not produce trismus.

9. Good food, fresh air, congenial surroundings, and employment of both mind and body are of great benefit in obtaining successful results.

M. N. FEDERSPIEL.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Lilienthal, H.:** *The Surgical Treatment of Empyema of the Thorax.* *Mil. Surgeon*, 1919, xlv, 582.

Empyema is not as a rule unilocular; therefore drainage by simple incision and insertion of a tube or by rib resection will be sufficient in only about 33 per cent of cases. Instead of breaking into the main cavity, secondary collections may invade other structures, such as a bronchus. Moreover, the lung is often markedly contracted by an inflammatory exudate which forms early and at the end of ten days is tough and unyielding though it may be readily stripped from the lung. Two problems are thus presented, first, the problem of saving life, and second, the problem of preventing deformity. The procedure varies with the type of case as follows:

Group A, acute cases in which the chest is full of pus and there is immediate danger to life: Cyanosis, dyspnoea, and sepsis are present. A radiograph should be made if time permits and a minor thoracotomy performed. If the patient is not improved within six days, a further fluoroscopic examination should be made while he is in the erect position, and this should be followed by a major thoracotomy.

Group B, subacute and chronic cases, often long unrecognized: Radiographs and a fluoroscopic examination should be made with the patient in the erect position. If the empyema is small and encapsulated, treatment may consist in the resection of one or two ribs. Otherwise, a major thoracotomy should be performed.

Group C, chronic cases in which there are sinuses and undrained cavities following operation: These should be carefully studied with the X-ray. The chest should then be prepared for operation by disinfection for from four to six days by Carrel's method. The operation should consist of thoracoplasty with lung mobilization. No operations to collapse the chest wall should be done.

The author describes the operations recommended briefly as follows:

Minor thoracotomy: Local anæsthesia, short incision between the ribs, and insertion of a small thick-walled tube.

Major thoracotomy: General anæsthesia, preferably by the intrapharyngeal method. The incision is made in the seventh interspace, the pleura are opened, and the pus is withdrawn by suction. The wound edges are then separated with rib spreaders and all fluid and coagula removed. Soft adhesions

are broken down and the lobes of the lung separated. If a tough confining membrane is present it is incised longitudinally and laterally until the lung expands with coughing or straining. The wound is closed by layers, with drainage at the angles.

Thoracoplasty with lung mobilization: Preliminary disinfection is effected by the Carrel-Dakin method, a watch being kept for bronchial fistulæ. Intrapharyngeal insufflation anæsthesia is used. The incision is made as in a major thoracotomy. From one to four ribs may have to be divided before exposure is sufficient. An old sinus is avoided. The thickened visceral pleura is incised longitudinally and by cross-hatching if it does not peel off readily. The anæsthetist insufflates and distends the lung. The wound is closed in layers. Morphine is then given in full doses for twenty-four hours. Blowing exercises are begun at once.

For anæsthesia by intratracheal insufflation, which is very simple, a foot bellows, an ether bottle, and a catheter are required. The latter is passed through the nostril as far as the pharynx. To distend the lung the opposite nostril is closed and the mouth covered.

E. M. MILLER.

**Dodge, W. T.:** *Empyema at Base Hospital, Camp Sherman, Ohio.* *J. Am. M. Ass.*, 1919, lxxii, 1808.

The author states that before deciding on the treatment he would adopt he reviewed the results which had been obtained at this base hospital prior to July 1, 1918.

He found that in 53 cases treated in the surgical service for empyema there had been 23 deaths. Simple thoracotomy with open drainage had been performed in 49 cases and rib resection in 4 cases.

All had been treated with open drainage and instillations of Dakin's solution. The Dakin solution had then been discontinued and 2 per cent formalin in glycerin substituted. While an improvement had been noted with the later method, subsequent experience with these patients had proved disappointing. Fifteen patients treated with Dakin's solution recovered and were discharged. Fifteen remained after the change had been made to formalin and glycerin. Of the latter, 4 were returned to duty. The 11 others were subjected to secondary operations. Two of these died, making the final number of deaths 25 in a series of 53 cases.

The pleural fluids showed the hæmolytic streptococcus in 5 cases while in the majority the non-hæmolytic streptococcus was found.



Simple aspiration as well as aspiration followed by the injection of formalin and glycerin had been tried but both methods had been discontinued in favor of wide-open drainage.

The author treated 3 cases according to the method used in 1918 at the Walter Reed Hospital, the so-called "closed method" of aspirating and irrigating through a 3-millimeter tube. Dakin's solution was used at first and later 2 per cent formalin in glycerin. These cases were subsequently treated by rib resection.

Dodge finally decided to use aspiration merely for diagnostic purposes. When the pleural fluid became purulent, a rib resection was performed under local anæsthesia and two large drainage tubes were inserted. In no case was resection done earlier than seventeen days after the onset of pneumonia. The average period was twenty-five days.

No irrigations or instillations were used during the first ten days. Dakin's solution was used in 5 cases, formalin and glycerin in 5 cases, and 50 per cent glucose in several. Later the only solution employed was physiological sodium chloride solution. The patients treated with Dakin's solution and formalin and glycerin had to be subjected to rib resection later. The pleura in these cases was found at the secondary operation to be covered with a thick layer of organized lymph. From this fact the author concluded that irrigation with Dakin's solution and formalin-glycerin tends to thicken the pleura and prevent expansion of the lungs.

No definite statistics are given as to the number of cases treated without irrigation. In 18 cases irrigation was done with saline solution and in this series there were no deaths. The final results are not mentioned.

Of the 71 patients treated between July 1, 1918, and April 1, 1919, 68 were treated by open drainage. Eighteen of these died. Thirty-six patients recovered and returned to duty prior to April 15, 1919. Ten patients were subjected to secondary operations.

V. P. DIEDERICH.

**Gloyne, R.: The Clinical Pathology of Thoracic Puncture Fluids.** *Lancet*, 1919, cxcvi, 935.

Careful study of fluids obtained by thoracic puncture gives much information of diagnostic value.

Antiseptics should not be used in preparing the sterile syringe. Clotting in the fluid reduces the value of the examination and can be prevented by the addition of 1½ per cent citrate solution to three parts of the fluid.

The examination consists of determinations of the specific gravity and coagulable protein content, a cell count, film and cultural examinations for bacteria, and immunological tests.

The author points out that when a purulent pleural fluid contains tubercle bacilli it is strongly suggestive of a pneumothorax, even in the absence of clinical signs.

The various types of fluid are discussed and the following conclusions drawn:

1. In a serous fluid, especially if tuberculosis be suspected, coagulation of the fluid should be prevented whenever possible. If a clot forms, it generally contains most of the bacteria and cells and should therefore be examined carefully.

2. More use might be made of immunity tests in serous tuberculous fluids.

3. Though the predominance of the small round cell (so-called lymphocyte count) is almost invariable in simple tuberculous effusions, this is not true in effusions following pneumothorax. In the latter, predominance of polymorphonuclear cells is not uncommon.

4. In the series reported tubercle bacilli were found in 63.6 per cent of pyopneumothorax cases, in 55.5 per cent of serous effusions with pneumothorax, and in 25.7 per cent of apparently simple tuberculous effusions.

5. In the same series the following were the percentages of secondary infections: in pyopneumothorax, 18.2; in serous effusions with pneumothorax 11.1; and in simple tuberculous effusions, none.

6. Contrary to the results of earlier observers, Grégoire and Courcoux found during the war that in cases of hæmothorax clotting did not take place if sepsis could be prevented. Absorption was generally preceded by hæmolysis. They noted also a characteristic cell count—first polymorphonuclear, then mononuclear and endothelial, and finally, eosinophile cells predominating.

7. The cases of empyemata examined by the author showed pneumococci in 58 per cent, streptococci in 12 per cent, staphylococci in 12 per cent, mixed infections in 12 per cent, and other organisms in 6 per cent. The pneumococcus is probably the most prevalent organism, and occurs approximately four times more frequently than the streptococcus.

K. L. VEHE.

**Saugman, C.: Thoracoplastics for Pulmonary Tuberculosis in the Vejle fjord Sanatorium** (Erfaringer fra Vejle fjord Sanatorium om Thorakoplastik ved Lungentuberkulose). *Ugeskr. f. Læger*, 1919, lxxxi, 585.

Saugman refers to the results of thoracoplastics for lung tuberculosis reported in Scandinavian literature by Jacobaeus and Key, Nyström, Bull, and others. He gives also his own experiences based on the treatment of 26 cases during the last two years at his Vejle fjord Sanatorium. In these, treatment by artificial pneumothorax had been tried first without success.

The operation is performed usually with the aid of local anæsthesia. Large doses of the anæsthetic are necessary to block the nerves. The danger of such large dosage is shown by Saugman by reference to the case of a young girl who was treated by preliminary injection of veronal and morphine followed just before the operation by the injection of 190 cubic centimeters of ½ per cent novocain solution. The operation in which five ribs were sectioned and sutured lasted only fourteen minutes, but the patient



died shortly afterward. Such an occurrence, however, is exceptional. As a rule, local anæsthesia is easier for the patient and greatly facilitates the operation.

A tabular statement is given showing the amounts of rib removed, generally from the fourth to the eleventh. The average length resected was 134 centimeters. Subperiosteal resection of the ribs appears to be the most advantageous and it is well to perform the operation in two stages. After the resection, the removal of adhesions, and the emptying of the pus pockets, the thorax collapses very considerably on the side operated upon. After hæmostasis is effected the thorax is closed with catgut sutures in two layers.

Morphine, pantopon, etc., are given after the operation to allay pain and for stimulation.

In 12 of 18 cases there was apparently complete disappearance of the tuberculosis bacillus from the sputum after a few months. Cases of recurring hæmoptysis were generally much relieved by operation but in one instance it recurred fatally seventeen days afterward. There were also 2 other deaths, 1 from pulmonary embolism and the other from influenza. The latter occurred several months after operation when the patient was free from symptoms of tuberculosis.

The article includes a tabular statement of all cases operated upon with case histories and several illustrations.

W. A. BRENNAN.

**Egidi, G.: The Indications and Technique of the Operative Treatment of Mammary Cancer** (I criteri direttivi e la tecnica per la terapia operatoria del cancro della mammella). *Policlin.*, Roma, 1919, xxvi, sez. prat., 385.

Egidi reviews the ramifications of cancer of the breast and the metastatic outbreaks with their routes. The various operative methods of meeting the conditions are discussed critically, especially the techniques of Handley and Halsted. The review leads to a description of the method of breast amputation practised by Tansini in Italy since 1895. This is a plastic method destined to complement the extensive removal of tissues in this destructive operation and to fill the gap left by the extensive removal of the breast and its adjacent tissues. It consists essentially of cutting a strip including skin and muscle from the region of the back and twisting this flap around to the site of the removed breast. The circular incision around the breast is prolonged upward until the two ends meet in the axilla; from here a new U-shaped incision is started downward in the back, care being taken to spare the branch of the circumflex artery in this region which supplies nourishment to the pedicle of the strip. The pedunculated flap is well nourished and repairs the loss created by the removal of the pectorals.

Tansini's flap has been used by many surgeons in Italy and also in France with good results.

W. A. BRENNAN.

## TRACHEA AND LUNGS

**Jervey, J. W.: Bronchoscopic Side-Lights on Bronchoscopic Cases.** *South. M. J.*, 1919, xii, 333.

Jervey offers the following bronchoscopic side-lights on bronchoscopic cases which he reports:

1. Don't take anybody's word for what he has or has not seen in peroral endoscopy. Be a Missourian.
2. Don't take anybody's word as to what area he has or has not explored in the course of endoscopic peregrinations. Look for yourself.
3. Don't take anybody's diagnosis of the presence of a foreign body in the air passages or œsophagus, no matter how clear and definite the anamnesis. Make your own diagnosis.
4. Don't decline to use a certain mechanical principle or a certain instrument just because a colleague has previously tried it in the same case and failed. Difficulty for one man is opportunity for another.
5. Don't forget—to paraphrase the famous dictum of the dusky Reverend Jasper of Virginia, in his reference to the sun—that sometimes “the foreign body do move.”
6. Don't forget that the second peroral endoscopy performed on the same patient is likely to be easier than the first and the third easier than the second. You owe it to your patient and to yourself to prove it.
7. Don't be in too great a hurry to refer your patient to a colleague for operation, even though you know he is a better man.

O. M. ROTT.

**Graham, E. E.: Foreign Bodies in the Air and Food Passages.** *Arch. Pediat.*, 1919, xxxvi, 325.

The observations of the writer are summarized as follows:

1. According to statistics about 66 per cent of the cases of foreign bodies in the air passages are those of children.
2. Case histories show that foreign bodies are often overlooked because of the period of latency of symptoms following the first dyspnoea and choking attack.
3. The symptoms vary greatly. In one instance, for example, the presence of a peanut kernel may cause an acute inflammatory reaction and later pneumonia, while in others metal objects may remain in the lung for a very long time and cause comparatively little damage.
4. A foreign body in the œsophagus that does not cast a shadow on the X-ray plate may often be diagnosed by giving the patient a bismuth-filled capsule. The X-ray will then show this capsule held in position by the foreign body.
5. Foreign bodies are very rarely coughed up.
6. The presence of a foreign body should be suspected if the following conditions are present: an unexplained leucocytosis, localized symptoms in one lung that do not clear up under treatment, the absence of tubercle bacilli in the sputum, and a gradual decrease in weight and strength.
7. Bronchoscopy should be performed as soon as possible. Children do not require an anæsthetic.



8. The necessity of taking a radiograph of every patient who gives a history of having swallowed a foreign body cannot be too strongly emphasized.

9. The asthmatoïd wheeze is a symptom of considerable importance. S. S. HOWE.

### PHARYNX AND ŒSOPHAGUS

**Austoni, A.: The Treatment of Severe Cicatricial Œsophageal Strictures** (Contributo all' indirizzo di cura delle stenosi cicatriziali de alto grado dell' esofago). *Policlin.*, Roma, 1919, xxvi, sez. chir., 150.

Austoni treats œsophageal cicatricial strictures by progressive dilatation. He gives clinical histories of 4 such cases and reviews the literature. From this review and his personal experience he concludes that:

1. Absolutely impermeable cicatricial stenoses of the œsophagus are extremely rare, in fact exceptional; the stenoses observed usually have a degree of permeability which permits passage of at least a fine bougie.

2. All cicatricial œsophageal stenoses, even those which are least permeable and those which are extensive and old, may be successfully treated by dilatation. This procedure is much less dangerous and is more often successful than any other mode of treatment.

3. The first stage of the dilatation treatment is to pass a bougie through the stricture, which prepares the strata and acts as a guide for the subsequent manœuvres. This may be effected either through the mouth or through a preformed gastric fistula. The buccal route is indicated for stenosis situated in

the upper cervical and thoracic regions and the retrograde route for cases in which it is lower and those which cannot be managed from above.

4. Œsophagoscopy is of special use in facilitating dilatation through the mouth. Also of value are the methods customarily used in cases of urethral stricture. Gastric endoscopy, with the indirect vision apparatus, is recommended for retrograde sounding. If during the examination the patient is made to swallow a little milk, which passes into the stomach in strings, it will facilitate the location of the cardia.

5. The best method of treating severe, extensive, and old cicatricial œsophageal strictures is that of intermittent progressive dilatation, through the buccal route with the aid of œsophagoscopy, and by the retrograde route with the aid of a directing thread. Each sound should be allowed to remain in place for about two hours. In infants, however, and in cases of stenoses situated high and conveniently, metallic dilators may be used as in the treatment of urethral strictures.

6. Hypodermic injections of fibrolysin should be given with the dilatation treatment of cicatricial stenosis.

7. The average duration of the treatment is about three months. It is desirable, however, to resume the sounding every one or two months for about a year to prevent recurrence.

No recurrence has been observed up to the present time in any of the author's cases, but he believes that patients should be kept under observation for from five to ten years before it can be assumed that the cure is definite. W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Hupp, F. L.: Abdominal Drainage.** *W. Virginia M. J.*, 1919, xiii, 441.

This subject is of great importance and there are many conflicting opinions as to when the peritoneum can be trusted to push back an invading foe from the abdomen independently. The great capacity of the peritoneum for resorption and its power to put up a stiff defense has led the present-day surgeon to drain less and less.

According to Munro, there are three factors which should be considered when there is an inclination to dispense with drainage following peritoneal infections: (1) the individual equation as regards susceptibility to infection; (2) the virulence of the infection; and (3) the presence or absence of distinct foci of infection.

Posture has become a very important adjunct in the treatment of peritoneal sepsis. Fowler's position is most commonly adopted. The basic principle of postural treatment is that the most active and rapid absorption into the lymphatics takes place from the diaphragmatic and omental

peritoneum, while the pelvic peritoneum is very slow to absorb. The author mentions the importance of transporting patients in the sitting position when peritoneal sepsis is suspected.

Bowlby has stated that very probably drainage of war wounds of the abdomen is of little use except in local lesions. He reports an operative mortality of 50 per cent, which in civil practice would be exceedingly high, but was considered good under existing conditions. Gibson stated that the treatment of war wounds is a highly specialized branch of surgery and the rules of civil practice apply hardly at all at the front. Multiple wounds gave a mortality of 68 per cent as against 20 per cent for single wounds. An operation was performed whenever the pulse was perceptible. Drainage was instituted in only a few of these cases, and then was continued for only from twenty-four to forty-eight hours.

In cases of intra-abdominal abscess cavities, whether of appendix or tubal origin, it has been repeatedly demonstrated that the charted microbic curve progressively falls to the zero line when the installation tubes have been carefully placed and



the technique of Carrel rigidly enforced. It should be emphasized, however, that Carrel never intended his system of wound sterilization as a substitute for early clean surgery and the removal of all foreign material.

The drainage tube itself is condemned by a great many who claim they have obtained brilliant results without it. Hathaway substitutes a piece of soft folded rubber for the tube. He believes that if more surgeons would do this they would find not only that their results are very much better, but also that their outlook on surgery is totally changed. Applying his experience in war surgery, he began by sewing up ordinary staphylococcic abscesses of the subcutaneous tissues after incision and wiping out with "bipp." These wounds healed by first intention. He then went a step further. After operating upon a case of perforated gastric ulcer and washing out the peritoneal cavity with flavine, he closed the abdomen up tight. The result was healing by first intention and uninterrupted recovery. The same procedure was followed in a case of compound fracture of the tibia and fibula with a large external wound, and a case of gonococcal peritonitis following rupture of a fallopian tube. The result in both cases was healing by first intention.

In cases of questionable drainage for acute appendicitis the author has invariably used the McBurney "gridiron" incision as this is less likely to be followed by a hernia and affords adequate drainage.

Long has recorded 39 cases of acute appendicitis, some of the gangrenous type, in each of which he closed the abdomen. His results were gratifying in 37 of the series.

Kelly definitely sets down essential points to be remembered. The drain is only a drain to a limited extent and for a short time, acting chiefly as a protective pack. It is essential that the whole septic area should be drained. The drain must be loose in order that it may absorb rapidly, and must have exit through a large orifice.

The author prefers the split-rubber tube wrapped with gauze and covered with a rubber dam which is rolled cigarette fashion and placed at the bottom of the septic pit. Care must be taken to select pliable pure rubber in order to prevent the perforation of an intestine or large blood-vessel due to pressure of an unyielding hose-pipe tube.

In respect to tuberculous peritonitis it has been stated that: (1) those afflicted with tuberculosis do not die from the disease but from associated sepsis; (2) the abdomen should never be drained in tuberculosis of the peritoneum; (3) the pure products of tuberculosis in the pelvis should be removed, whenever possible, by clean, careful operation.

The whole subject of drainage is based upon certain definite scientific principles which must be applied with judgment to each individual case. The surgeon should therefore get hold of the prin-

ciples and should not follow an unvarying ritual in every case of pus abdomen which comes to the operating table.

E. A. PRINTY.

**Montoya, J. M.: Umbilical Hernia** (*Hernia umbilical*). *Rep. de med. y cirug. de Bogotá*, 1919, x, 338.

During the past six years Montoya has operated upon 132 cases of hernia in infants of which only 8 were cases of umbilical hernia. An equal or greater number of cases were treated mechanically.

Mechanical treatment of umbilical hernia in infants is quite satisfactory if sufficient time—generally from a year to a year and a half—can be devoted to it. Otherwise operation is necessary. In children not more than 2 years old the most practical method is to make an incision directly over the tumor, carefully dissect the sac and, if it is small and not adherent, reduce it. This can be done without opening the peritoneal cavity by approximating the edges of the ring with deep silk sutures, and then closing the skin with interrupted sutures. The skin sutures are removed on the eighth day. The use of a band is recommended for at least six months after operation. If the sac is very large or there are adhesions, it ought to be resected and the peritoneal opening sutured with catgut.

In the cases of older children the author prefers the technique described by Mayo which he used in the treatment of 8 children ranging in age from 3 to 10 years. One of them had been operated upon previously by the more rapid technique of obliterating the ring by freshening the muscular edges. The hernia recurred, however, within six months. The re-operation by the Mayo method has given satisfactory results.

W. A. BRENNAN.

**Cole, P. P.: The Radical Cure of Femoral Hernia by the Inguinal Route.** *Brit. M. J.*, 1919, i, 763.

The author strongly advocates the use of the inguinal route in the radical cure of femoral hernia. He uses the incision which is usually employed for inguinal hernia and carries the dissection down to the transversalis fascia by dividing the external oblique aponeurosis, and by dislocating the cord or round ligament. In incising the transversalis fascia the extraperitoneal fat is exposed and the epigastric vein lying to the inner side of the epigastric artery marks the outer edge of the peritoneal diverticulum that leads to the femoral ring. Exposure of the outer aspect of the neck of the sac can then be done satisfactorily and blunt dissection will isolate the neck of the sac so it can be determined whether anything is passing through it from the peritoneal cavity.

In some instances by further dissection the sac can be delivered from its position in the thigh. It is then opened and ligated above the juncture with the peritoneal cavity. The iliac vessels are then tracted outward and the femoral ring defined. Three sutures are placed through the conjoined tendon above and below through the thickened margin of the femoral ring—Cooper's ligament. The outer suture, being



close to the vein, should be inserted first. The approximation of these tissues forms a new bed for the cord or round ligament, and all direct communication with the peritoneal cavity is abolished. When the sac, although empty, can be delivered from the thigh, Cole amputates at the neck and then closes the resulting hole in the peritoneum. He does not leave the empty sac in position, however, but removes it by undercutting the lower lip of the incision. If the sac is not empty, the peritoneal cavity is opened immediately without any attempt at delivery of the sac. In strangulated femoral hernia the operation has even greater advantages.

The advantages of the inguinal route are summarized as follows: (1) it provides a certain means of cure; (2) it permits a direct view of the essential structures; (3) abnormal conditions can be recognized and dealt with; (4) resection can be undertaken through the original incision; and (5) it is neither difficult nor complicated.

D. C. BALFOUR.

### GASTRO-INTESTINAL TRACT

**Kessler, E. H.: A Plea for the Early Recognition of Stomach Malignancies.** *J. Missouri M. Ass.*, 1919, xvi, 181.

The author emphasizes the importance of the early recognition of cancer of the stomach. In addition to the history and laboratory and clinical findings the physician should have recourse to the X-ray and, if necessary, an exploratory incision. The diagnosis should not be delayed for the appearance of anorexia, vomiting, hæmatemesis, melena, occult blood in the stools, dysphagia, loss of weight, and the formation of a palpable tumor with dilatation of the stomach.

E. C. ROBITSHEK.

**Urrutia, L.: A Case of Brinton's Linitis Plastica** (Sobre un caso de linitis plastica de Brinton). *Arch. españ. de enferm. d. aparat. digest.*, 1919, ii, 201.

Urrutia reports a typical case of Brinton's linitis plastica in which he performed a total gastrectomy which was followed by recovery.

The patient was a man aged 26 years who for about a year vomited several times a day after the ingestion of food and had lost much weight. On physical examination a large movable tumor could be felt in the epigastrium extending from the left costal border to the umbilicus. Examination of the stomach contents showed the absence of free hydrochloric acid. On radiologic examination a diffuse infiltration was observed throughout the stomach which preserved its form only in the region of the fundus. There was also pyloric insufficiency. The condition was diagnosed as Brinton's linitis.

At operation the stomach was found to be cylindrical in shape, hard, and intimately bound to the liver and the transverse colon by fibrous adhesive masses. It was liberated with great difficulty, the coronary artery ligated, the duodenum sectioned about 3 centimeters from the pylorus, and

the end of the duodenum sutured. The stomach which was then connected only with the œsophagus was brought to the surface and sectioned high in the cardia region. This having been done, an anastomosis of the œsophagus to the jejunum was made according to the Reichel-Polya method. The patient stood the long operation well.

For several days following there was some diarrhoea and an intense painful colitis with mucus and pus in the stools. After two weeks, however, the discharge became normal and the remaining symptoms cleared up. Several months after leaving the hospital, the patient's weight had increased considerably, the fæces were solid, the appetite good, and the general condition quite satisfactory.

Radioscopy showed that the jejunum had undergone marked dilatation and retained the food reaching it directly from the œsophagus for some time.

On histologic examination of sections of the pylorus and other parts of the removed organ no evidence of malignant epithelial neoformations was found.

Photographs of the removed stomach are given and the author discusses the literature of plastic linitis.

W. A. BRENNAN.

**Lecène, P.: Inflammatory Stenosis with Spasm of the Cardia; Considerable Œsophageal Dilatation; Cardioplasty; Recovery** (Sténose inflammatoire avec spasme du cardia; dilatation œsophagienne considérable; cardioplastie; guérison). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 710.

Lecène's case was that of a soldier in whom examination showed a stenosis of the cardia and considerable œsophageal dilatation. The diagnosis made was "spasmodic or organic stenosis of the cardia, perhaps due to the cicatrization of an ulcer." Lecène decided to operate directly upon the cardia and not by simple gastrostomy. By means of an incision along the left chondrocostal margin the cardia was reached without difficulty. The œsophagus above the cardia was found to be strictured by a very thick fibrous band which encircled the muscles. Near the cardia was an inflamed ganglion. As the stricturing band included several small vessels it was sectioned between ligatures. There was no sign of a neoplasm. The lesions being similar to those found in the pyloric region near a pyloric ulcer, the author performed a cardioplasty following the technique of a pyloroplasty. The patient made a good recovery.

When in cases of stenosis surgical intervention is necessary, the author believes that simple gastrostomy should be performed only as a last resort as it does not always overcome the stenosis and results in considerable trouble if a subsequent operation is required.

Œsophagogastric anastomoses are extremely severe operations which necessitate opening the pleura and there is no certainty in regard to the prognosis or as to the value of their results.



The only other surgical treatment is cardioplasty as executed by the author in this case, a method which appears to be the simplest and most logical.

While Lecène does not draw any general conclusion from the success in this particular case, he calls attention to three points in the technique: (1) placing the patient in dorsolumbar lordosis; (2) definite resection of the edge of the left costal cartilage; (3) the use of a head mirror during the whole operation.

W. A. BRENNAN.

**Hernando: Suprarenal Insufficiency and Gastric Ulcer** (Insuficiencia suprarenal y ulcera gastrica). *Med. Ibera*, 1919, vii, 156.

The pathogenesis of gastric ulcer has yet to be cleared up satisfactorily. That the etiology is varied is shown by the fact that ulcer may result from gastric, appendicular, and arteriosclerotic processes, and Addison's disease. In the author's opinion gastric ulcer is usually secondary, and rarely, if ever, primary.

Recently there have come to Hernando's notice several cases of ulcer traceable to suprarenal insufficiency. This is in accord with his contention in a previous article that the glands of internal secretion have an influence upon the functions of the digestive organs and that ulcer may be due to a disturbance of the endocrine processes.

In this article it is pointed out also that the vagus nerve has a part in gastric pathology and the conclusion is reached that all patients with ulcer are vagotonic. The mechanism of the production of ulcer is explained by the statement that the vagus stimulates contractions which, by interrupting the circulation, form ischaemic zones and that such zones are easily attacked by hydrochloric acid.

Organotherapy fails as a method of treatment because usually it is instituted in the final stages of the condition when the effects of the initial cause are irremediable.

W. A. BRENNAN.

**Friedenwald, J.: Personal Experiences in the Treatment of Ulcer of the Stomach.** *Med. Clin. N. Am.*, 1919, ii, 1575.

According to our present understanding of the etiology of gastric ulcer, prophylaxis includes the removal of sources of focal infection and the use of a carefully selected diet. With the appearance of the first symptoms the patient should be placed on an exclusively milk diet.

Medical treatment is indicated in all simple, uncomplicated cases of gastric and duodenal ulcer. The results of ambulatory treatment are unsatisfactory. In severe cases the patient should be put to bed for from six to eight weeks or longer. The writer records recovery in 72 per cent of cases treated by the Leube method, in 66 per cent treated by the Lenhartz method, and in 86 per cent treated according to the Sippy method. These methods are briefly described.

If there is excessive vomiting, pain, or hæmatemesis, food by mouth should be withheld for three to five

days and rectal feeding substituted, preferably by the Murphy drip method, using normal salt solution containing glucose. Duodenal feeding by the use of the Einhorn tube is valuable, especially when there is severe nausea and vomiting. Atropin, which decreases the secretory and motor functions of the stomach by depressing the vagus fibers, appears to have an almost specific effect in some instances. Scarlet red is a valuable adjuvant, superior to bismuth, especially in the treatment of ambulatory patients.

Operation is indicated when there are complications and when the ulcer has resisted thorough medical treatment, particularly in cases accompanied by severe and persistent pain, vomiting, or hæmorrhage, and in stenosis due to pyloric or duodenal ulcers. Prompt operation is indicated in all cases of perforation and for ulcers accompanied by tumor formation. The type of operation naturally varies according to the situation and extent of the ulcer.

According to Finney and the writer, the results of pyloroplasty and pylorotomy are far better than those of gastro-enterostomy. From a comparison of 100 cases of pyloroplasty with the same number of cases of gastro-enterostomy, the following conclusions were drawn:

Pyloroplasty is indicated chiefly for the relief of pyloric stenosis due to chronic ulcers situated at or near the pylorus and on either side of it and resulting from the cicatricial contraction following the healing of such ulcers. It is often useful in cases of bleeding ulcers of the lesser curvature, in cases of duodenal ulcers not well controlled by medical treatment, and in chronic dyspepsias due to ulcers not relieved by medical treatment. The special advantage of pyloroplasty lies in the opportunity afforded for the excision of all ulcers in the anterior wall of the stomach and duodenum after direct inspection of the affected part, and the application of the operation to ulcers situated in the posterior walls. It does not greatly disturb the normal relation between the stomach and intestines. Most objections to the operation are more fanciful than real. The only contra-indications are the inability to mobilize the duodenum when adhesions are too dense and when thickening and infiltration about the pylorus due to hypertrophic forms of ulcerations are present.

The immediate as well as the final results of pyloroplasty are most encouraging. Gastro-enterostomy should be limited as far as possible to the relief of pyloric stenosis due to malignant disease. In nearly all other conditions pyloroplasty and pylorotomy are safer and more satisfactory. Finney and the writer report 90 per cent of immediately successful recoveries and 86.6 per cent of satisfactory end-results after pyloroplasty, and 82 per cent of immediately successful recoveries and 77.2 per cent of satisfactory end-results after gastro-enterostomy.

Baetjer and the author have pointed out that the degree of healing can be determined by means of the X-ray. Though a patient may feel perfectly well after rest-cure treatment, a second X-ray examination often shows the same characteristic signs as the



first. In such patients symptoms may recur after the ordinary diet is given. By repeated X-ray observations it can be observed when the ulcer has healed.

Relapses are often due to dietary indiscretions following the "cure." The patient should be placed for some months upon a carefully regulated diet of acid-free and easily digested food, with intermediate feedings and alkalies. It is desirable to have patients return every three or four months for a year or more in order to determine the ultimate result of the treatment.

Diets used during the Sippy cure and diets recommended following ulcer treatment are appended.

W. H. NADLER.

**Macdonald and Mackay: The Immediate and End Results of Gastro-Enterostomy for Gastric and Duodenal Ulcer. A Study of 330 Cases** (Los resultados inmediatos y lejanos de la gastro-enterostomía en la úlcera del estómago y duodeno. Estudio de 330 casos). *Rev. españ. de cirug.*, 1919, i, 253.

In a study of the results after gastro-enterostomy it was found that gastrojejunal ulcers occur in 30 per cent of the cases. The question arose also as to whether this complication does not occur even oftener since undoubtedly all cases are not operated upon.

It is possible that the secondary disturbances observed in patients who have had a gastro-enterostomy may originate from less advanced lesions at the site of the anastomosis. It is evident that some of the symptoms are due to renewed activity of ulcers in the vicinity of the pylorus or spasmodic contractions in the ulcerated areas since many surgeons have reported complete relief from these secondary symptoms following a pylorotomy performed months or years later.

It is possible that with greater experience the treatment of the ulcerated areas may become more radical. Although pylorotomy has a definitely higher mortality, it may replace gastro-enterostomy in certain cases if with improved technique it becomes as safe and especially if the pylorus is not definitely obstructed or inflammatory lesions do not predominate. When there is cicatricial obstruction of the pylorus gastro-enterostomy is a very beneficial operation.

It is probable that in the next ten years a very careful study of the type of lesion revealed by operation, the immediate mortality, the end-results, and especially the incidence of new ulcers, will be the factors upon which the decision between the two operations will be based.

Gastro-enterostomy has been on the whole the best therapeutic treatment of gastric diseases, completely curing a large number of such patients condemned to certain death by inanition and for whom medical treatment is powerless. It will always be the method of choice for the patient who has been weakened by the disease.

W. A. BRENNAN.

**Foxworthy, F. W.: The Medical Treatment of Duodenal Ulcer, with Special Reference to the Treatment of Hæmorrhage.** *J. Indiana M. Ass.*, 1919, xii, 152.

Medical treatment is indicated in cases of simple duodenal ulcer, in most hæmorrhagic cases, and occasionally after operation.

The author's methods are illustrated in a detailed case report. Among the various means of controlling hæmorrhage which are reviewed, blood transfusion, intravenous injection of normal horse serum, and intramuscular injections of whole blood are recommended.

Absolute rest in bed, preferably in a hospital, is essential. Patients whose cases are severe should not be permitted to walk before from six to eight weeks.

In both simple and hæmorrhagic cases diet is of particular importance. The author follows a dietary schedule which may be divided into five stages:

1. Nutrient enemata. For a period of from four to seven days during which only chipped ice is permitted by mouth the patient is given rectal feedings and the required medication by the Murphy drip method at six-hour intervals after cleansing enemata of normal salt solution.

2. Liquid diet. In the beginning of a period lasting from one to two weeks only the whites of two eggs or cream are given at three-hour intervals. The amount is then gradually increased.

3. Semiliquid diet. This diet is continued for one week and permits the substitution of soups and purées at one or more feedings.

4. Semisolid diet. Porridge, mashed potatoes, custards, and eggs are added as albumin water is withdrawn. This diet is continued for one week. If ulcer symptoms recur, however, the liquid diet is substituted for all feedings.

5. Solid diet. In this diet lean meat broiled and finely divided is added until the patient is finally given the ordinary diet prescribed for ambulatory cases of ulcer.

During the period of liquid feeding daily gastric lavage with 1 per cent of sodium bicarbonate is given. Acidity should be counteracted by the smallest effective amount of alkalines such as calcined magnesia and sodium bicarbonate. Bismuth is of value in the absence of hæmorrhage. Muscular contractions may be controlled by the use of increasing doses of tincture of belladonna temporarily withdrawn when the desired effect has been obtained. Special care of the mouth and the eradication of evident and potential foci of infection in the teeth and gums is important.

W. H. NADLER.

**Ombredanne, L.: Total Volvulus of the Intestine of Chronic Nature** (Volvulus total de l'intestin à évolution chronique). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 688.

The case reported was a case of volvulus of all of the intestines, large and small, the symptoms of which had persisted for more than ten years and



were cured by untwisting. The patient was a girl about 12 years old who since 2 years of age had been subject to repeated attacks of vomiting. The vomitus was greenish and bilious in character. A thorough examination of the patient in the hospital, including a radioscopic examination, led to the diagnosis of duodenal or duodenojejunal stenosis. The torsion which was first discovered at operation amounted to one and one-half turns. This was untwisted and the child left the hospital on the seventeenth day in excellent condition.

The points of special interest in this case were:

1. The condition was a volvulus rather than intussusception.

2. Total volvulus is rare. The majority of cases on record are cases of partial volvulus. The author knows of only one other instance of complete torsion of all the intestines both large and small.

3. The volvulus was not accompanied by occlusion of either the large or small intestine.

4. There was absence of coalescence of the mesocolons, indicating that the condition was a true volvulus. In the author's opinion this congenital malformation is a necessary and essential condition for a really total intestinal volvulus though it is not a sufficient cause alone. He is inclined to believe that by itself, without volvulus, it may produce symptoms of pain and biliary vomiting intermittently.

5. The symptoms due to the volvulus had persisted for ten years. In this particular the case is unique. In all of the reports in literature read by the author there was a double occlusion which led to a rapid termination either by death or surgical intervention. A few cases are recorded of incomplete torsion followed by spontaneous untwisting. In the author's case there were no spontaneous intermittent torsions followed by untwisting.

6. The volvulus was treated successfully by untwisting and fixation of the colon by catgut sutures.

W. A. BRENNAN.

**Lewis, W. A.: Intestinal Obstruction and Its Relation to the General Practitioner.** *Canadian M. Ass. J.*, 1919, ix, 538.

Practical hints in regard to the early recognition and management of intestinal obstruction are given in this article.

The author emphasizes the importance of recognizing these cases early and operating upon them immediately. The physician should not wait for the classical picture to develop because this means an advanced case. The failure to pass flatus is significant of obstruction even though high enemata may return fecal matter. In giving enemata air must not be introduced into the bowel as its return may be mistaken for flatus.

Strangulation accompanying obstruction adds to the gravity of the case as a disturbance in the circulation of the bowel reduces its vitality, injures the mucous epithelium, and promotes the absorption of toxins.

The author quotes Deaver: "Acute abdominal pain which causes vomiting unassociated with diarrhoea in nine cases out of ten is due to a condition best treated by immediate operation."

The operation should be confined to the simplest procedure that will produce good drainage.

The conclusions drawn are as follows:

1. The rapidity with which the accumulation of deadly toxic material takes place in the gut above the obstructing point and the danger that is thereby added to the simplest abdominal procedures are not sufficiently appreciated.

2. It is the gangrene consequent upon delay, the peritonitis set up by the migration of organisms through the damaged walls, the absorption of poisonous accumulations in the gut, and the necessity for performing extensive and less favorable operations on account of the added pathology due solely to delay that are responsible for the usually high mortality.

3. In the majority of our textbooks the characteristic features are carefully delineated and the occurrence of fecal vomiting emphasized, but nowhere is it stated that to wait for classical symptoms is in a large percentage of cases to invite death to the patient and court condemnation of the medical attendant.

4. The physician should explain to the patient that he suspects intestinal obstruction and that surgical interference may be necessary.

5. Morphia should not be given.

The author reviews experiments on the toxæmia in intestinal obstruction and reports nine cases.

K. L. VEHE.

**Zeno, L.: Exposition and Criticism of the Theories of Lane on Chronic Intestinal Stasis.** (Exposición y crítica de las teorías de Lane sobre la exstasis intestinal crónica.) *Rev. méd. de Rosario*, 1919, ix, 118.

In the first section of his article the author explains Lane's theory concerning the alteration of bodily structure by the pressure and tension produced by the attitude of the body during work and rest, using as an example the variation so produced in the skeleton and showing photographs of roentgenograms.

In the second section he applies these same laws to the alteration in the intestines and mesentery which according to Lane cause chronic intestinal stasis. He sums the matter up as follows: Chronic intestinal stasis is due to mechanical interference. Lack of equilibrium between the postures of work and rest causes displacement of the abdominal viscera, especially the digestive organs. This results in retardation of the fecal current. The extra weight is then opposed by the formation of membranes, which, at first beneficial, become fibrous and produce flexures and dilatations. The primary cause being still in force, a vicious circle is thus inaugurated. Lane, therefore, considers the condition to be purely mechanical and the treatment, surgical.



In the third section of his article Zeno tells of the opportunities he has had to study with Lane and to pursue similar studies anatomically on cadavers and at the operating table. In his critical remarks he covers the following points: (1) the origin of peritoneal membranes; (2) the origin of chronic intestinal stasis; (3) the therapeutic, medicosurgical, and prophylactic indications; and (4) the significance of chronic intestinal stasis in general pathology.

The term "chronic intestinal stasis" he states is unsatisfactory and a new term must be sought which will serve for all the many and complicated cases of alteration of the digestive and nutritive functions.

In the remainder of the article the author advances the opinion that the various bands of Lane are not purely mechanical, but the result of a coalescing of the serous surfaces of the intestinal and parietal peritoneum. He takes up each location where such bands occur and shows how these serous surfaces are brought into intimate contact under various normal and abnormal circumstances for a sufficiently long time to cause such coalescence. He considers practically all of Lane's constricting bands normal, rarely anomalous, and very seldom if ever pathologic.

M. M. MATTHIES.

**Goetsch, E.: The Occurrence of Gastric Mucosa in a Case of Meckel's Diverticulum Producing Intestinal Obstruction.** *Bull. Johns Hopkins Hosp.*, 1919, xxx, 143.

The occurrence in the human body of aberrant glandular tissue, at times in places far removed from the mother tissue, is a subject not only of general interest and of special interest to the embryologist, but of importance also to the pathologist and surgeon who frequently meet with abnormalities arising from such aberrant tissue.

The author's purpose in making this report is to record such an instance occurring in a case of partial obstruction caused by Meckel's diverticulum in which at operation a striking variation was discovered in the mucous membrane of the distal half of the diverticulum. This area was differentiated strikingly from the proximal mucosa by a sharp line of demarcation and a difference in color, surface character, and thickness. On subsequent sectioning, it proved to be of the precise character of gastric (fundus) mucosa, containing the typical gastric glands (foveolæ gastricae) composed of the two distinctive types of cells, the parietal and chief, each of which presented its characteristic of morphology and staining reaction. Goetsch desires also to explain the probable embryological origin of this gastric tissue in Meckel's diverticulum with a view to throwing further light upon the occurrence of aberrant glandular tissue at the umbilicus and in the remains of the omphalomesenteric duct.

The case is reported of a man, 19 years of age, who presented before operation symptoms and signs suggestive either of acute appendicitis or partial intestinal obstruction. On examination, there was

found just below the umbilicus a scar which had been produced by a former operation for an abscess. Upon subsequent operation it was found that the small bowel had become strangulated over a thick, fleshy cord consisting of Meckel's diverticulum and some adherent omentum which fastened the former to a point on the anterior abdominal wall just below the umbilicus. The Meckel's diverticulum with the adherent omentum was excised and the patient made an uneventful recovery.

Upon examination of the open diverticulum there was found in its distal third or fourth portion an area of thickened, irregular, granular, dark red mucosa which contrasted sharply with the proximal pale, finer mucosa which was of intestinal character. Furthermore, upon careful histologic examination this distal segment was found to consist of a mucosa definitely resembling in every particular that of the gastric fundus region. The glands were precisely of the fundus type and showed the characteristic zymogen granules of the chief cells and the eosinophilic granules of the parietal cells as characteristic in the glands of the stomach.

Upon a careful search of the literature it was found that a number of cases have been reported of the occurrence of gastric mucosa at the umbilicus in the form of polyps or fistulae. Other aberrant tissues, such as pancreas, have been described along the intestinal tract, and even in one instance in a nodule at the tip of Meckel's diverticulum and connected with its lumen. Another interesting case reported is that of Van Heukelom in which a nodule of mucosa was found at the tip of Meckel's diverticulum, constricted off from it, not connected with the lumen, but attached by a fibrous cord. This mucosa proved to be of pyloric nature. The case referred to by the author is the only one of gastric mucosa occurring in the wall of Meckel's diverticulum and in free communication with its lumen. Careful histologic examination was made necessary because of the rather uncertain findings reported by previous authors and because of the various theories which have been constructed to explain the occurrence of these aberrant tissues at the umbilicus.

The finding in the author's case of gastric mucosa in Meckel's diverticulum, which it is agreed quite generally is a definite remains or persistence of the vitelline or omphalomesenteric duct, makes it appear certain that these aberrant tissues occurring at the umbilicus, in fibrous cords, and in Meckel's diverticulum, have a uniform origin, namely, from the entoderm of the original intestinal tube or yolk stalk. It was very important to complete the evidence that these aberrant tissues may arise anywhere along the tract of the original omphalomesenteric duct in order to answer the various hypotheses.

After a review of these hypotheses and in view of the evidence that has been brought forward, the best explanation for the occurrence of these structures is that the original entodermal lining of the intestinal tube and omphalomesenteric duct possesses potentialities of development into any of the



glandular structures of the adult intestinal tract or of its accessory glands. Under the influence of certain circumstances, which we do not understand, groups of cells may retain one or the other potentiality and develop into a glandular tissue, very different from the surrounding glandular tissues and resembling the adult organ, such as stomach or pancreas, which may be far removed.

The finding in the author's case of gastric mucosa in Meckel's diverticulum effectively answers the various theories that the gastric growths at the umbilicus may have arisen by constriction or separation from gastric diverticula in the early fœtus, or that a differentiation in the mucosa or in these aberrant tissues is brought about by the presence or non-presence of the bile, or that irritations, inflammations, or foetal inclusions at the point of union of the blastodermic layers are necessary. In fact, with the findings in this case there is good evidence for believing that these aberrant tissues arise from remains of the omphalomesenteric duct. As to the ultimate factors which cause this differentiation, however, nothing can be stated at present.

The finding of this gastric mucosa explains well the reasons for the finding of acid secretion with digestion at the umbilicus in cases of umbilical polyps and fistulæ as reported in the literature, although cases in which gastric mucosa occurred at the umbilicus had been reported before. Again, there is a good embryological basis for understanding certain adenomatous tumors and growths of an intestinal glandular nature occurring at the umbilicus, in obliterated intra-abdominal umbilical cords, and in Meckel's diverticulum. In fact, in the case reported it is interesting to speculate as to the condition for which the patient had been operated upon several years previously. It seems probable that there was at that time a perforation at the tip of Meckel's diverticulum, though none was found at the operation. As a consequence of this an abdominal abscess formed which was simply drained and which healed with the formation of adhesions between the tip of Meckel's diverticulum and the anterior abdominal wall. It is interesting to think also that this perforation at the tip of Meckel's diverticulum might well have been a perforative gastric ulcer, for so far as the structure of the mucosa went the author was certainly dealing with the fundus type of mucosa membrane. This perforation evidently healed subsequently. The case further illustrates the desirability of examining carefully all cases of Meckel's diverticulum for the possibility of the occurrence of aberrant glandular tissues in the mucosa, because of the importance of these structures in embryology, pathology, and certain surgical conditions. G. E. BEILBY.

**Kirmisson: Surgery in the Treatment of Infants: Appendicitis** (*Chirurgie infantile, l'appendicite*). *Rev. gén. de clin. et de thérap.*, 1919, xxxiii, 369.

Owing to the great possibility of diagnostic error in cases of acute appendicitis in infants and on

account of the frequent involvement of the intestine Kirmisson emphasizes:

1. The absolute necessity of methodically exploring the abdomen with the patient under the influence of an anæsthetic in order to discover the location of the appendix by palpation accurately. It may then be determined whether it is best to make the incision on the sheath of the rectus, toward the iliac fossa, or in the lumbar region.

2. The necessity for resecting the omentum extensively as often it has become a purulent sponge infiltrated with bacteria and should not be returned to the abdomen to act as a focus of infection. When, however, the condition is of the type known as a "cold appendicitis" and there are only slight omental adhesions such resection is not necessary.

3. The necessity for always exploring the lower pelvis for purulent collections and immediately drying the pelvic cavity. Kirmisson uses a special drain of his own design. He does not recommend prolonged drainage or very voluminous compressive drains.

The administration of purgatives should be avoided. Of great value in these cases is the use of the Fowler position and the Murphy intrarectal drip. In addition, physiologic salt solution may be injected subcutaneously and injections of camphorated oil given when the pulse is weak. Intestinal stasis may be fought with pituitrin.

W. A. BRENNAN.

**Mayo, W. J.: Some of the Old Hospitals of London, with Special Reference to the Treatment of Fistula in Ano and Hæmorrhoids.** *Minnesota Med.*, 1919, ii, 197.

The writer calls attention to the scientific advantages offered by Great Britain to English-speaking surgeons and pays a tribute to the honesty and sound sense of the British surgeon. During the pleasant rambles that he had around the old city of London he learned the why and wherefore of many of her places of historic interest and the origin of certain descriptive names such, for example, as "bedlam," which was derived from the St. Bethlehem Hospital for the insane founded in 1297.

The Royal College of Surgeons of England, established in 1800, is not so old as the Royal College of Surgeons of Edinburgh which was founded in 1505 and signifies its origin by grant from Henry VIII by using the flat cap worn by him as part of its academic uniform. The marvelous specimens numbered in black and put up by John Hunter's own hands have been exhibited in the Museum of the Royal College of Surgeons of London for more than a hundred years.

For the treatment of special diseases there are many lesser hospitals in London which are not so old as those already named, yet much older than any other hospitals in the world. Examples of these are the Good Samaritan and the Women's Hospitals which have their counterparts in the various women's hospitals in this country. St. Peter's Hospital, devoted to the treatment of stone in the urinary bladder and other urinary conditions, has long been the center of



the urologic school of surgeons of Great Britain. It is there that Freyer and Thomas Walker work today. The new Brady Hospital in Baltimore under the able leadership of Hugh H. Young is the American expression of the same idea.

Unique and among the most interesting of these pioneer special hospitals is St. Mark's Hospital which was founded in 1835 and built for the treatment of fistulæ and other diseases of the rectum exclusively. It was here that the great Allinghams, father and son, worked and practised the ligature operation for hæmorrhoids. Fistula in ano has been well treated at St. Mark's Hospital for more than forty years.

Some time ago the writer was so fortunate as to become acquainted by personal observation with the methods introduced in St. Mark's Hospital for the repair of fistula in ano, and as a result is able to look back on a most satisfactory experience in the treatment of this annoying variety of infirmity. Goodsall pointed out that if a line were drawn transversely through the middle of the anus, all the fistulæ lying anterior to it would pass directly from the external skin opening to the internal opening inside the anal canal, and that all the fistulæ posterior to it would have their internal opening in the posterior midline of the anal canal, no matter where or how many lateral openings—the so-called horseshoe fistulæ—are present. In the anterior fistulæ, therefore, the external opening will be found opposite the internal opening. An anterior horseshoe fistula, as Edwards remarks, is practically unknown. The cause of the curved or angular shape of the posterior fistulæ, the external openings of which are lateral and lead by a crooked passage to the posterior internal opening, is the arrangement of the coccygeal ligaments and muscles which protect the external tissues lying in the posterior midline and direct the pus laterally; in this way the so-called horseshoe tracts and openings are formed.

The treatment of the posterior fistula, which is the most troublesome, consists of carefully following the one or more external openings to the posterior midline where the fistulous tract leading to the internal opening just above the external sphincter will be readily exposed. This is then split through and the incisions made by following the lateral fistulous tract are joined. If after the use of the curet the fistulous tract contains much thick scar tissue, the posterior wall of the tract is split to let the blood supply come through.

At King's College Hospital in 1862 Henry Smith originated the clamp and cautery treatment for hæmorrhoids, a method used in the Mayo Clinic in hundreds of suitable cases with the utmost satisfaction. It is more than twenty years since the writer learned to do the clamp and cautery operation properly by reading in the London *Lancet* an acrimonious discussion carried on between Allingham and Smith. The pile should not be trimmed away with the scissors because if the eschar pulls apart, the cut artery, which is most resistant, will bleed as Allingham stated; according to Smith, the pile should be slowly converted into an

aseptic eschar protected by the desiccated tissues, and the germs on the surface of the hæmorrhoid destroyed at the same time. The pile tissue should be caught in three places, a half inch of sound mucous tissue being left between each group of vessels destroyed by the cautery so that no stricture will follow.

### LIVER, PANCREAS, AND SPLEEN

**Einhorn, M.: Jaundice.** *Med. Rec.*, 1919, xcv, 1043.

The three types of jaundice which the author describes are as follows: (1) the obstructive type in which one or more of the canals draining the liver has become closed; (2) the hepatic type in which the liver cells which manufacture the bile lose the power of sending it through the biliary canals; and (3) the hæmolytic type in which it is believed that the bile is manufactured in the blood itself, the liver having very little or nothing to do with it.

The symptoms usually present and which are due to the bile itself are slowness of the pulse, drowsiness, lack of mental concentration, lack of energy, and quite often an itching sensation. Each case also has the objective symptoms which are due to the original disease. In many instances there is no pain at all; in others the patient has severe pain, chills, and fever, and is very sick.

In the differential diagnosis the obstructive types are the first to be considered. Catarrhal jaundice is the type most frequently encountered. In this condition the common duct is obstructed by the formation of a mucus plug and there are mild digestive disturbances such as lack of appetite, nausea, constipation, and perhaps vomiting. The patient suffers in this way for a few days or a week, and then all of a sudden turns yellow. However, there is no pain. The yellow color then increases, the urine becomes dark brown, and on examination is found to contain bile. The stools are clay colored. Examination of the duodenal contents will show some bile and ordinarily in the first twelve days of the disease there is a quantity of mucus.

The other type of jaundice which also appears in the acute form is caused by the obstruction of the canals of the biliary system by stones. Characteristic of this condition are severe pains preceding the attack which come on suddenly and are very acute; in some cases they are radiating, extending to the center and then to the right. When the common duct is not involved and stones are present only in the gall-bladder, the author believes the pain is brought on by spasm.

In some cases of duodenal ulcer in which there are no stones at all, the pain is characteristic of gall-stones and jaundice; this is thought to be due to a distinct spasm of one of the sphincters of the common duct. In such instances repeated examinations of the duodenal and gastric contents is necessary for the diagnosis.

The author mentions the case of one patient who was treated at Carlsbad for several years for gall-stones. He also had a typical attack of severe pain



and slight jaundice, elevation of temperature, and vomiting. Examination of the duodenal contents showed the presence of clear bile, pancreatic secretions, and blood. At operation no stones were found and the gall-bladder was normal, but there was pyloric spasm on account of the presence of duodenal ulcer. Undoubtedly at times this had caused a spasm of the papilla of Vater which had in turn resulted in the jaundice.

The author next considers the jaundice which is of a protractive character. While stones may be present in this condition also, other affections may be the cause of the yellow color. Protractive jaundice without pain at all is due usually to the condition which is termed "biliary cirrhosis of the liver." If, however, there is pain with no distinct periods of interruption, the condition is of the malignant type. In the malignant type the jaundice is extreme in spite of the fact that a great deal of bile may be found in the duodenum and in the stools. One case is mentioned in which there was considerable suffering, slight loss of weight, and extreme jaundice. The gastric contents showed the absence of hydrochloric acid and the presence of blood and lactic acid. The duodenal contents showed clear bile, but the pancreatic juice revealed the absence of trypsin ferment. The diagnosis of cancer of the stomach involving the pancreas and liver was confirmed at autopsy.

In the hæmolytic type the urine usually contains no biliary pigments, but the stool is colored and there is jaundice. Frequently the spleen is enlarged and the red blood corpuscles are markedly fragile.

A few points as to the medical treatment of jaundice are mentioned. In all acute forms the patient should have plenty of water, perhaps Carlsbad salts, and a light diet. If there is severe pain, hypodermics of morphine should be given until the attack subsides. If the patient has stones with repeated attacks, operative interference is necessary. In coming to a decision the X-ray findings, temperature, leucocyte count, and the patient's condition, must be considered.

In the stone form of jaundice which has continued for from five to six weeks without abatement, a diagnosis of stone in the common duct is justifiable and these cases should be operated upon.

In cases of protractive jaundice due to malignancy the patient should be operated upon even if only to make him more comfortable. The gall-bladder may be attached to the stomach or the intestine so that there is a free flow of bile.

Little can be accomplished surgically in biliary cirrhosis. In the author's experience, small doses of calomel followed by iodides have been very satisfactory. This treatment may not succeed in all cases, but everything should be tried before giving up, especially when nothing can be done surgically.

In the hæmolytic type in which the spleen is enlarged, splenectomy is recommended. The author mentions one case in which he used radium with satisfactory results.

E. A. PRINY.

Wollstein, M., and Mixsell, H. R.: Report of a Case of Hepatoma in an Infant. *Arch. Pediat.*, 1919, xxxvi, 268.

This article gives the history and findings in the case of a baby who was first seen when it was 4 months of age. The child was brought to the dispensary for dietary instructions and because of a lump about the size of a peanut under the right lower rib. This lump was first noticed when the child was 3 months old. The family history was negative except that the maternal grandmother had diabetes. The child's past history was also negative.

At the time of examination the patient was poorly nourished and sallow. At the bases of both lungs were a few scattered subcrepitant rales. There was no adenitis. A fine generalized maculopapular rash was present. There was no distention, rigidity, or tenderness over the abdomen. Both liver and spleen were palpable below the costal margins. At the lower border of the liver a nodule about 2 by 3 centimeters in diameter, smooth and hard, was palpated. The reflexes were normal and there were no deformities.

The baby was not seen again for six weeks. It was then brought in for double bronchopneumonia. At this time a large mass, taken to be the liver, was felt in the abdomen. Its lower border extended into the right iliac fossa, and small, hard, elastic, smooth nodules could be felt upon its surface. The spleen was palpable at the costal margin. There was no ascites. The Wassermann and von Pirquet reactions of both the child and its parents were negative. A diagnosis of congenital sarcoma of the liver, probably primary, was made.

The recovery from the bronchopneumonia was uneventful, but about three months later the child was brought back in an extremely emaciated condition. The abdomen measured 41 centimeters at the xiphoid and 35 centimeters at the umbilicus. The ribs were pushed outward and the diaphragm upward. The abdomen was greatly distended and the superficial veins were prominent. The mass was larger than at the time of the previous examination. In the left groin were four bluish nodules attached to the skin, the largest  $\frac{1}{2}$  centimeter in diameter. Death occurred in a few days.

An autopsy was performed five hours after death. Acute bronchopneumonia was present in about one-half of the left lower lobe and the right lung. The upper lobe on the outer surface just below the apex showed a hard white nodule 3 millimeters in diameter, evidently a metastasis. The abdomen contained, from 20 to 30 cubic centimeters of thin fluid blood in the pelvis. The organs were somewhat displaced, due to the enlarged liver. The spleen was slightly enlarged but exhibited no nodules. The heart, adrenals, and kidneys were negative. The liver weighed 860 grams and measured 18 centimeters in length and 17 centimeters in width. The upper surface was nodular, pale, and fatty. The anterior border was rounded and thickened by the growth



which showed through the capsule as small, round, greenish masses with dilated vessels between the nodules. The posterior border was nodular and entirely made up of neoplasm. The left lobe was filled with nodules and the lower surface was almost entirely made up of new growth. The main mass occupied the anterior half of the liver. The growth was soft and bile stained and contained many small hæmorrhagic and softened areas. In the posterior portion the nodules were less bile stained, more hæmorrhagic, and in some places white in color. Between the nodules and liver substance there was no capsule but a capsule was simulated by a compressed mass of liver tissue. The anatomical diagnosis was hepatoma, pulmonary metastasis, subcutaneous inflammatory nodules. Microscopically the growth was a primary epithelial tumor of liver cells. This condition is very rare in children and is either adenomatous or carcinomatous in type. Only a few cases have been recorded.

I. W. BACH.

**Robin, A.: Hydration and the Soluble and Insoluble Residues in Cancer of the Liver; a New Conception of the Genesis of Cancer** (*L'hydratation, le résidu soluble et le résidu insoluble dans le cancer du foie. Une nouvelle conception sur la genèse du cancer*). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 699.

Robin finds that cancerous liver tissue contains a quantity of water higher than that of normal liver tissue under the same conditions. The hydration reaches its maximum in the most cancerous parts and as a rule amounts to 14 per cent. In the healthier parts it amounts to about 10.3 per cent. With the development of the growth it increases.

This hydration is not characteristic of cancer alone as it is observed also in the liver of the consumptive and in tuberculous lungs. In the acute form of phthisis, however, the water content of the least involved regions of the lung falls considerably below the normal while in the cancerous liver it is above that of the normal liver in regions which are relatively healthy.

Hydration is a phenomenon common to all rapidly growing tissues and is related to their histogenetic activity. Like all growing tissue cancer possesses the power to construct with a given quantity of solid material more histologic substance than other tissue. Indirect proof of this is the fact that the amount of water tends to diminish in fatty tissues (the alcoholic fatty liver, for example) and in such tissues histogenetic activity is decreased.

Hydration of cancerous tissues involves a decrease in the amount of both organic and inorganic matter which is greatest in the most extensively involved areas. In the tuberculous lung the areas least involved by the disease contain more organic and inorganic material than the normal lung.

The process might be considered as due to the effect of a ferment which splits the proteins of the

organ in the parts involved by the cancer and by a reverse action collects electively in some cells the amino acids set free to effect a rapid growth and an ungoverned multiplication.

The author's conclusions are based upon the analysis of cancerous livers, the livers of 5 persons who were affected with tuberculosis, including cases of acute and rapid development, the liver of an alcoholic, and the liver of a patient who died of cerebral hæmorrhage. Two normal livers were studied as controls. The analytical results are given in several tables.

W. A. BRENNAN.

## MISCELLANEOUS

**Alexander, M. E.: Surface Temperature in the Diagnosis of Surgical Abdominal Conditions.** *N. York M. J.*, 1919, cix, 1077.

The author ascertained the surface temperature of the abdomens of 50 normal persons and of 250 persons who had diseases of the abdominal organs. In the latter cases the determinations were made at the point of maximum tenderness or rigidity and compared with the opposite side. His conclusions are as follows:

1. In surgical inflammations of the abdominal viscera (except the kidneys) there is no elevation of temperature of the skin overlying them.

2. In unilateral inflammation of the kidney there is frequently a localized elevation of surface temperature.

3. In 74 per cent of cases of unilateral suppuration of the kidney the surface temperature of the affected side was one degree or more higher than on the unaffected side.

4. In advanced tuberculosis of the kidney the surface temperature may be lower than on the unaffected side.

**Miller, L. I.: Mesenteric Thrombosis, with a Review of the Literature.** *Colorado Med.*, 1919, xvi, 148.

Of 214 cases reported in the literature only 197 were accurately described as being arterial or venous varieties. In the cases in which this was stated there was no essential difference in the course.

The condition may be acute or chronic, the latter being characterized at times by relapses and remissions.

Following a discussion of the etiology, which is obscure, and a description of the pathology, the author gives a résumé of the symptoms.

The onset is sudden and characterized by a colicky pain which in 51 per cent of the cases is generalized. In 67 per cent this is accompanied by generalized abdominal tenderness. Nausea and vomiting soon follow, the vomitus varying from stomach contents to biliary, fæcal, or blood-containing material. There may be constipation or diarrhoea. In the latter cases the stools are bloody. The symptoms may be those of a severe type of intestinal obstruction.



In one case seen by the author there was a sudden onset of generalized abdominal pain, nausea, vomiting, and severe constipation. The patient entered the hospital in shock, with tympanitis on the right side and dullness on the left. An enema partly

returned contained dark tarry blood. The white-cell count was 28,000 and the red-cell count  $5\frac{1}{2}$  million. The hæmoglobin was 90 per cent. Operation revealed extensive and advanced involvement of the descending colon.

K. L. VEHE.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES

Baetjer, F. H.: Osteomyelitis. *Am. J. Roentgenol.*, 1919, vi, 259.

In discussing the roentgen diagnosis of osteomyelitis, the author describes the pictures which may be obtained depending on the portion first involved, the character of the destructive process, the path of extension, the character and location of new bone proliferation, and the condition of the cortex.

Attention is called to the fact that a hæmatogenous infection usually affects the medulla first, and the cortex and periosteum are not involved early.

When the periosteum is first involved the changes are confined to the periosteum and cortex, and there is resulting osteitis and periosteitis.

When a joint is primarily involved the involvement occurs first in the articular surface. Later it spreads to the head of the bone. The medullary canal does not become attacked until later, if at all.

In compound fractures all of the bone structure may become involved simultaneously.

While osteomyelitis does not give us a constant picture, the author believes that if we would keep clearly in mind the principles of bone infection we would recognize it when it is present.

Two changes take place in osteomyelitis: destruction and reproduction of bone. The more virulent the infection the slower the beginning of bone reproduction. Early in a virulent infection the haversian canals may be filled with pus, but if no destruction of bone has taken place there will be no evidence of it on the roentgen plate.

The earliest changes which can be demonstrated on the plate are vacuolated areas in the medulla which appear as areas of lessened density and are formed by regions of bone destruction with normal bone between them in the cortex. This finding alone is sufficient to differentiate osteomyelitis from malignancy, as tumors spread in all directions leaving no normal areas. The infection finally penetrates the cortex in one or more places, leaving normal cortex in between.

Bone proliferation begins at the point where infection starts. The periosteal bone is deposited on the outside, a fact which differentiates osteomyelitis from tumors of the cortex which expand the cortex.

In acute osteomyelitis destruction predominates and there is very little bone proliferation. In the chronic form the reverse is found.

Luetic osteomyelitis gives a picture identical with that of pyogenic osteomyelitis but which can be readily differentiated as in the former more than one bone is usually affected. As a rule the bone involvement is widespread but the clinical symptoms are extremely mild. In cases of pyogenic osteomyelitis the reverse is true.

The author urges that a careful history of all operative cases be obtained in order that we may be correctly informed as to whether the areas of destruction are due to bone disease or the surgeon's curette.

The presence or absence of sequestra or involucrum is easily discovered from the plate and frequently determines the character of the operation to be carried out.

W. A. EVANS.

### FRACTURES AND DISLOCATIONS

Hicks, C. F.: The Operative Treatment of Fractures. *W. Virginia M. J.*, 1919, xiii, 401.

Fractures cause more trouble to the conscientious surgeon than any other of the many conditions which he is called upon to treat. During the past several years, however, the treatment of fractures by the general surgeon has not received the attention it deserves. It is unnecessary to demonstrate that the present methods are unsatisfactory. In the treatment the points of greatest interest to the patient and necessarily of most concern to us are, first, to obtain good union; second, to decrease the period of disability; third, to prevent shortening as much as possible; and fourth, to obtain pronation and supination unhindered, with all joint functions preserved and followed by a good anatomical result.

The methods of treatment are the non-operative and the operative. In regard to non-operative treatment, some believe and teach that traction and countertraction are efficient means for securing perfect adjustment of fractured bones and always a sufficiently accurate adjustment to give a functionally useful limb. They contend that an exact anatomical result is not essential for a perfect functional result. Others maintain, however, that a retained anatomically perfect reduction is necessary to obtain a functionally useful limb, and this can be secured only by the open method with direct fixation of the fragments by plates or Parkham's bands. While it is true that we are not having more non-unions than formerly, this is due to the fact that we are operating on ununited fractures much



earlier as it is now possible to make an accurate diagnosis with the aid of the X-ray.

Every fracture is a hospital case, for the X-ray is the only means we have to check up the results, and the proper handling of the average case requires study and great care. The majority of fractures of the long bones should be treated by the operative method. A fair trial of the operative method under the most careful aseptic treatment will justify the following conclusions:

1. The X-ray picture will show that in some cases of fractured femur, humerus, tibia, and both bones of the forearm at the middle or upper third it is a physical impossibility to secure perfect adjustment after repeated attempts at reduction.

2. Some of these cases can be treated by the open method by which the proper reduction of fragments may be effected and retained without the use of any foreign body.

3. The danger of a foreign body placed on a fracture has been exaggerated.

4. For some fractures the Lane plate is the most simple and efficient aid in fixation, especially if the picture shows a wide separation of fragments and interposition of tissue, as in the lower fourth of the femur.

5. Parkham's band applied to a fracture of the shaft of the femur which the radiogram shows to be oblique or spiral will bring about immediate immobilization. It requires only a small incision and causes little mutilation of the tissues.

6. Temporary internal fixation insures practically anatomical reduction, and as it is a great aid in the dressing of compound fractures, greatly simplifies the after-treatment.

7. The early removal of a band or plate after repair of a fracture will prevent osteitis.

8. The early application of a band or plate will prevent a later operation by autogenous bone graft.

9. The X-ray has demonstrated that the watchful waiting of non-operative treatment is unsatisfactory and has shaken our confidence in manual reduction maintained by splints, extension, and suspension. It therefore will force us to use more accurate methods.

P. H. KREUSCHER.

**Carlsson, P.: Concerning the Treatment of Fractures of the Femur** (Ueber die Behandlung von Bruechen am Oberschenkelschaft). *Nord. med. Ark.*, 1919, li, Ark. f. Kir., 573.

The author reports all the cases of fracture of the shaft of the femur which came to treatment at his clinic between the years 1910 and 1917. In 1909 X-ray examination of all fractures was inaugurated and the treatment was more or less controlled by it.

One hundred and fifty-eight of the patients were males and 47 females. Fifty-five per cent were children under 10 years of age. The type of fracture in these was usually spiral or transverse. The spiral fracture was more common in those over 1 year of age but in those who were younger almost all of the fractures were directly transverse. The second

large group were those occurring in young men and men up to the age of 50 years. As a rule these were due to industrial accidents and were either simple transverse, short oblique, or comminuted fractures. The localization was somewhat variable, but was usually in the shaft and more rarely near the ends. Spiral fractures were rare in this group; more common was the bending fracture due to an indirect force. Few women were included in this group. The spiral fracture was again found in those more than 50 years old but then occurred almost exclusively in women and usually in the lower end of the femur, less frequently in the upper end, and rarely in the center. The cause in such cases was more or less indirect force, frequently insignificant. The conclusion is therefore apparent that the bones of women at this age are more brittle.

Five fractures were compound but all of these were treated aseptically and behaved like ordinary closed fractures without any complication. In two cases interposition of soft parts occurred, necessitating operative interference on account of non-union.

The author reviews all the current methods of treatment employed by him for the various groups of fractures as follows:

1. Placement and immobilization of the limb to keep the ends of the bone in position by the position of the limb.

2. Reposition and immobilization of neighboring joints by means of splints or a plaster cast.

3. Open treatment by operative means to reduce the fracture and immobilization to retain the position.

4. Functional treatment to retain the function of the injured limb irrespective of the anatomical defect which might result.

5. Extension treatment: (1) indirect extension by means of adhesive plaster or some similar adhering substance, and (2) direct extension by Steinman's nail extension method or Schmerz's ice tongue or clamp method.

Only 2 patients were treated by the first method; two old women of 79 and 91 years respectively. In both cases the leg was placed between two sacks of sand and slight extension applied with the patient in bed until union was obtained. The results were unsuccessful.

Only the new-born and very small children were treated by reposition and splints or body fixation. With the latter method the limb was flexed directly upon the abdomen and held in place with bandages according to a method similar to that used by obstetricians. The splints used were splints made of ordinary wood or the ordinary Volkman wire splint. Only 7 cases were treated by this method, 6 of these patients being children under 3 years of age. In 2 cases the results were perfect. In 3 there was a slight angulation of the bones at the site of fracture and in 1 a shortening and lateral displacement. One patient, a woman of 71 years of age, had a fracture of the lower third of the femur without any dislocation. After treatment with a Volkman splint for



forty-three days a good result was obtained as shown by the examination five and one-half years later.

#### REPOSITION AND PLASTER CASTS

Thirty-one cases were treated with reposition and plaster of Paris casts. Of these 19 were treated exclusively by this method. The age of the patients varied between 5 and 78 years. There were 8 transverse, 7 oblique, and 4 comminuted fractures. The average length of time the cast was left on was five and one-half weeks. In the majority of cases the dislocation was rather marked and in only 4 out of 19 was there no shortening. All the other patients had shortening of the limb amounting to from 1 to 8 centimeters. An ideal result was obtained in only one case, and in this instance the dislocation was only trivial.

Summed up the results were as follows: Shortening, which was present in 16 cases at the time of fracture, was corrected entirely in 6, decreased in 7, and unchanged in 3. Extensive dislocation *ad catus* which was present in 19 cases was entirely corrected by reposition in only 1 case. In another case it was partially corrected and in the remaining 17 was not influenced at all. In 1 instance it was even aggravated. Angulation which was present in 12 cases was corrected in 7, improved in 1, and not influenced in 4. In 18 cases in which the author was able to estimate the retentive ability of a plaster cast he found only 5 in which the correction obtained at reposition was retained by the cast. In the remaining 13 the condition became worse after the cast was applied and in 8 of these the position of the fragments became worse than before the reposition. In 10 cases the function at the time the patient was discharged was more or less limited. Of 14 patients, examined from one and one-half to seven years later by the X-ray, only 2 were functionally and anatomically normal and both of these were children, 3 and 5 years old respectively. The remaining 12 patients had permanent dislocations; all had shortening from 2 to 5 centimeters, the average shortening being  $3\frac{1}{2}$  centimeters. In addition there was definite deformity in 10 cases. Normal function with abnormal anatomical results was obtained in only 2 of these 12 cases, and both of the patients were 13-year-old boys. Of 14 patients re-examined, therefore, 10 showed more or less functional disability, such as pain, muscular weakness, atrophy, and joint stiffness, but all were above 13 years of age.

#### OPEN OPERATION

The number of cases treated by open operation was 19 and the ages of the patients varied from 7 to 65 years. Eleven of the fractures were transverse, 5 oblique, and 3 comminuted. Three were in the upper third of the femur, 11 in the shaft proper, and 5 at the lower end. Two were compound fractures. In only 2 cases was the operative treatment undertaken primarily; in the others it was employed as a secondary method following failures by other methods. The time of operation varied from three

days to seventy-four days after injury. Six operations were performed within ten days. In 1 case the treatment was an absolute failure and in another death occurred before reduction could be controlled. In only 7 was there an exact reposition of fragments. In 2 cases a dislodged fragment was apparent and in 9 there was more or less angulation. Definite shortening was found in 2 cases and lateral displacement also in 2. In 2 others resection of the end of the fragments had to be done to maintain reposition. Later re-examination showed similar findings.

The end-results were perfect in 7 cases. In the others there was functional disability as before. In 6 there was muscular atrophy or weakness, in 7 stiffness of the part, and in 1 severe pain. The average age of the patients in whom a perfect result was obtained was only 10 years whereas that of the others was 44 years. The danger in this group, of course, is infection which occurred in 3 cases out of 20 and resulted in 2 deaths.

#### INDIRECT EXTENSION AND VERTICAL SUSPENSION METHOD

Ninety-nine cases were treated by indirect extension and vertical suspension. The ages of the patients varied from 6 months to 11 years, the average being  $4\frac{1}{2}$  years. Forty-seven of the fractures were spiral, 35 transverse, 3 oblique, and 3 comminuted. Two of the fractures were in the upper end of the femur and all others in the shaft proper. The duration of treatment varied from eight to forty-one days, the average being twenty-one and one-half days. In 12 cases this method had no effect upon the dislocation and other measures were necessary. The immediate results of the treatment in other cases were as follows: shortening was present in 41 cases but absent in 44. In 3 cases it was more than 2 centimeters, in 13 under 1 centimeter, and in the others from 1 to 2 centimeters. Angulation and lateral displacement were present at the end of the treatment in 42 cases. In 21 of these there was no shortening.

In determining the end-results of the treatment it was found that in 42 cases examined by the author personally there was shortening in only 3, the amounts being 1,  $1\frac{1}{2}$ , and 3 centimeters, respectively. In 11 of these 42 cases X-ray pictures showed some degree of displacement. Of 33 patients who reported by letter, 32 stated that they were perfectly restored and that there was no difference between the two limbs. Bending was present in only 1 case. The function was normal in all of the 75 cases. The danger of this method consists in the possibility of adhesive-plaster decubitus which occurred in 4 cases.

#### INDIRECT EXTENSION METHOD WITH HORIZONTAL POSITION OF LIMB

By the method of indirect extension with horizontal position of the limb 39 cases were treated. Fourteen of these patients were less than 14 years of age, 19 between 15 and 50, and 6 over 50 years. Fourteen of the fractures were transverse, 17 ob-



lique, 1 spiral, and 7 comminuted fractures. Six occurred at the upper end of the femur, 26 in the shaft proper, and 6 at the lower end. In all of the cases except one the treatment was begun within three days after the accident. The average duration of the treatment was thirty-five days. In 9 cases all the displacement was corrected; in 4 it remained the same; in 6 it became worse; and in 16 it was more or less improved. In regard to the variety of the displacement the author states that shortening was corrected completely in 13 cases, diminished in 10, unchanged in 3, and increased in 5. Lateral displacement was corrected in 3, improved in 3, unchanged in 20, and increased in 3. Angulation was corrected in 9 cases, diminished in 4, unchanged in 3, and increased in 10 cases. Hospitalization varied from forty-two to two hundred and fifty-three days, the average being seventy-eight and five-tenths days.

Late results: Of 20 patients examined by the author personally, 10 showed no shortening and the remainder, shortening of from 1 to 5 centimeters. In 9 cases the displacement was the cause of the shortening. The functional result was apparently normal in 17 cases. In 3 there was pain over the site of the fracture, in 6 joint stiffness, in 5 muscular atrophy and weakness, and in 7 pain in the entire limb.

#### DIRECT EXTENSION

Twenty-nine cases were treated by direct extension, 21 with the Steinman nail extension method; and 8 with the Schmerz clamp or ice tongue method. In 24 cases the nail or clamp was applied at the condyles of the femur, in 4 at the head of the tibia, and in 1 at the malleoli. General anæsthesia was employed for the nail extension method but local anæsthesia was sufficient for the clamp method. The nail was driven in without preliminary skin incision, whereas in the clamp method the skin, soft tissues, and periosteum were first incised. Disinfection was accomplished with tincture of iodine. In 8 cases the semiflexion principle was adopted, flexing the knee on the thigh to an angle of about 135 degrees. In the remainder of the cases the thigh was flexed on the abdomen but the leg was extended at the knee-joint. In the semiflexion method the leg was held in a hammock-like contrivance supported directly from the bed.

The ages of the patients varied from  $5\frac{1}{2}$  to 79 years. Nine were less than 15 years old, 16 between 15 and 50, and 4 more than 50. There were 17 transverse fractures, 9 oblique and spiral fractures, and 3 comminuted fractures. Twenty-four were directly in the shaft, 3 at the upper end, and 2 at the lower end.

In only 8 of these cases was the method employed primarily. Nineteen had been treated with the indirect extension method previously and 2 had been treated elsewhere. The duration of the treatment varied from nine to thirty-six days, averaging twenty-three days. Shortening was entirely overcome in 24 cases, and in 9 of these a transient hyperex-

tension was observed. In the remainder the shortening was overcome from 8 centimeters to 1 centimeter in one case and from 5 to 3 centimeters in another case. In the others no effect on the shortening was obtained. Lateral displacement was entirely corrected in 2 cases and improved in 13. In 12 there was no effect exerted upon it by the method. In 7 cases aggravation of the position of the fragments was noticed. Hospitalization varied from forty-two to one hundred and forty-one days, averaging sixty-four and one-half days.

In regard to the late results, the author states that of 24 patients who were heard from, 4 reported perfect recovery. Of 20 who were personally examined by the author 9 showed no shortening, 4 showed lengthening of the limb, and the remaining 8 had shortening varying from  $1\frac{1}{2}$  to 7 centimeters. In only 3 was there no angulation or lateral displacement. The period of disability varied in 14 cases between two and eight months, averaging four and four-tenths months.

The principal danger of the method is of course, infection. Of 29 patients, 22 progressed without any irritation where the extension apparatus was applied. In 2 cases a doubtful infection was observed, in 1 a definite infection, and in another an infection without any bone involvement. In 2 cases there was a definite osteitis in the neighborhood of the foreign body and the nail and clamp had to be removed. No other complications occurred.

#### REVIEW OF METHODS

Considering first the group of patients whose ages were below 14 years, we find that the direct extension method as well as the operative method rendered a perfect result in all cases treated by these methods and re-examined. The indirect extension method gave 2 imperfect results among 14. The least favorable results were obtained with the plaster of Paris cast, only 2 out of 5 being perfect.

The most important group of course is the group of patients whose ages were between 15 and 50 years. In this the plaster cast method again rendered the worst result, all patients having a permanent displacement and some disturbance of function. The operative method and the indirect extension method gave about similar results, only about one-sixth to one-seventh of the cases respectively having a perfect result and about one-half having malposition and functional disturbances. The direct extension method shows a definite superiority over these, the results being perfect in nearly one-half of the cases and only two-sevenths of the patients having malpositions and functional disturbances.

In the aged none of the methods rendered a perfect result, but the permanent extension method showed slight superiority.

The author therefore concludes that the plaster of Paris method gives the worst results, 10 of the cases so treated belonging to the group with the worst results. The operative and the indirect extension method are nearly equal, about one-half of



all the cases so treated having perfect results. The indirect extension method is somewhat superior, however, in that only one-quarter of the cases so treated belonged in the group of worst results (malposition and disturbance of function) whereas of the cases treated by the operative method nearly one-half belonged to this group. The direct extension method is decidedly superior, 14 of 24 being perfect results and only 5 belonging in the group of worst results.

#### REQUIREMENTS OF THE METHOD CHOSEN

1. To be effective the method must permit correction of the displacement and maintenance of the bone in the correct position until consolidation has set in.
2. It must permit permanent extension of the limb in the semiflexed position.
3. It must permit motion in the joints, especially in the knee-joint, almost from the beginning of the treatment.

Therefore reposition with a plaster of Paris cast must not be employed as a permanent method of treatment. While for transportation purposes this method has some value as shown in war surgery, for the actual treatment of fractures of the shaft of the femur in the hospital it should not be employed.

Position with the application of a splint can be employed only when there is no displacement and when it is unlikely to occur. In fractures of the femur in the new-born the use of the body splint is perhaps the best method.

The operative method must be considered in a different light from the others. By the operative method of course is meant plates, reposition of exposed fracture ends, wiring, bone inserts, bone pegs, etc. The special indication is the interposition of soft parts between the fracture ends. After reposition extension must be employed as usual and the danger of the method is thereby much diminished.

Permanent extension is the normal method but the author is still undecided whether to advise the direct or the indirect method. Semiflexion of the knee-joint is highly desirable and is easily obtained with the direct method whereas it is difficult to obtain with the indirect method. In fractures in children the indirect method is undoubtedly effective as is shown by the author's material. That the late results of these cases are so good, however, is due not to the superiority of the method but rather to the better restitutive ability of the young. For infants and very small children the Schede vertical suspension method is without doubt the best method as it permits cleansing the child very easily. The age limit for its use is placed at about 7. Up to the age of 15 Bucks extension with semiflexion of the limb is perhaps better than for older persons. If indicated, direct extension should be used. The author is of the opinion that elderly persons stand the direct extension especially well.

#### OUTLINE OF TREATMENT

The treatment must be individualized and based upon the patient's age, the primary displacement, muscular development, and general condition.

The aim of the method should be a perfect anatomical result as well as a perfect functional result. The former must not be obtained at the expense of the latter. The following rules are advised:

1. Every fracture of the femur should be a hospital case.
2. The treatment should be instituted as soon as possible after the injury and after a preliminary X-ray examination. The case should not be left over night nor should the disappearance of the swelling be awaited.
3. The treatment must aim to correct the displacement during the first few days. If the method chosen does not accomplish this a more effective method must be substituted.
4. The reposition should be accomplished principally by permanent extension with the limb in the semiflexed position. A preliminary forced reposition is unnecessary and if any time has elapsed between the injury and the time treatment is begun it is dangerous on account of the possibility of a thrombus.
5. Slight passive motions in the knee-joint should be practiced as early as the day after the application of extension. Slight active motions may be tried a week later. The removal of the extension apparatus should be followed by massage.
6. In the cases of adults weight-bearing should not be permitted sooner than ten weeks after the injury. Even in the cases of children care must be exercised in permitting weight-bearing.
7. The patient should remain in the hospital until all function is normal.

#### TECHNIQUE OF THE DIRECT EXTENSION METHOD

The greatest danger is infection. Primary infection is doubtless rare. It probably creeps from the skin along the foreign body, either nail or clamp, and is promoted by the reaction around the foreign body. It is therefore evident that the smaller the foreign body the less the danger. For this reason the author prefers the clamp or ice tongue. Strict asepsis is essential at the time of application. The daily use of tincture of iodine around the site of application of the extension apparatus is advised. Early removal of the foreign body is of primary importance. As soon as the displacement is corrected and considered firm enough the clamp or nail should be removed. It is better to replace it in a few cases than run the risk of infection by leaving it too long. The site of application also deserves some consideration. The condyle of the femur, of course, is the best and logical place. To apply extension at the calcaneus interferes with semiflexion. Christen objected theoretically to the use of the condyles because most of the muscles the pull of which we aim to overcome by traction are inserted into the head of the tibia and therefore he believed the latter would be the



logical place to apply the extension. By doing so, however, pressure occurs upon the joint surface, there is weakening of the joint ligaments from overstretching and loss of tone may result with increased mobility. Only in the lowest fractures should extension be applied to the tibia to avoid the hæmatoma in the lower end of the femur and thigh if a nail is employed. Occasionally the nail becomes loosened in the bone and the danger of infection is much greater. The employment of the clamp obviates this.

A very important point is the position of the limb. The most advantageous position is semiflexion with the leg suspended in a hammock-like contraption suspended from a framework attached to the bed. The framework for the hammock as well as that for the extension should be attached to the bed so that the removal of the patient for X-ray examination may be accomplished without moving the limb. Contra-extension is rarely needed in the treatment of adults as the body-weight is generally sufficient. In the cases of children it may be necessary. The value of frequent X-ray examination for control is hardly necessary to mention as it is self-evident. Constant watchfulness on the part of the surgeon is also necessary for a good result. Turning the case over to an interne after applying the extension is to be condemned. To obtain a good result a hearty and intelligent co-operation on the part of the patient is also necessary.

L. A. JUHNKE.

#### SURGERY OF THE BONES, JOINTS, ETC.

**Leriche, R., and Policard, A.: The Value of the Signs Considered Indicative of Vitality in Bone Grafts** (De la valeur des signes tenus pour caractéristiques de la vie des greffes osseux). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 902.

It is usually considered that a bone graft is alive if: (1) it fills its therapeutic rôle; (2) on radiographic examination it is found to have increased in volume; (3) at operation it is reddish and vascular, bleeds on curetting and has all the "aspect of life"; (4) fractures of the graft have become consolidated.

The authors state that while these signs have been accepted as a matter of faith, none of them has the least biological value. There is no macroscopical sign of life in a graft and there is only one criterion of any value, i. e., the histologic criterion.

Although a graft may be well vascularized and bleed easily, the bone tissue may be dead. When a graft takes, its bone tissue is resorbed and new bone gradually takes its place. Osteogenesis is the result of local deposits of calcium. Resorption is followed by ossification and it is for this that the graft remains, and plays its part.

In the authors' opinion the use of preserved grafts of dead bone, either human or heteroplastic grafts, will be the method of grafting of the future, and henceforth efforts should be turned in that direction.

W. A. BRENNAN.

**Goyanes, J.: Resection and Transplantation of Large Bone Segments in the Treatment of Sarcoma of the Long Bones of the Extremities** (Resección y transplantación de grandes segmentos óseos en el tratamiento del sarcoma de los huesos largos de las extremidades). *Rev. españ. de ciruj.*, 1919, i, 251.

Cases of sarcoma involving bone which in the past have been treated by amputation of the limb can now be treated by resection, owing to progress in the plastic surgery of the osseous system.

Large segments from the diaphysis and above the diaphysis transplanted with their periosteum preserve or regenerate their vitality and replace the functions of the resected areas.

The transplant seems to be resorbed slowly by osteoporosis and is replaced by degrees without loss of its macroscopical individuality by the osteogenetic power of the periosteum or of the neighboring metaplastic cellular tissue.

The transplant modifies its architecture in conformity with the law of functional adaptation and tends to acquire the form and diameter of the replaced segment.

Owing to its lesser importance the fibula is to be preferred for the replacement of large extirpated segments, its diaphysis or the diaphysis with the epiphysis being utilized according to the graft required.

Infection of the wound does not necessarily mean the loss and elimination of the graft.

Partial sequestration of the graft is possible, the remainder being integrally preserved as in the case of a normal bone attacked by septic infection.

In addition to transplants for pseudarthrosis, etc., the author's statistics comprise 7 large bone resections for sarcoma, 4 of the tibia and 3 of the femur. In one case in which the tibia was involved a transplant was obtained from the diaphysis of the fibula according to the Hahn-Huntington method; in the other three tibia cases resection of part of the diaphysis and of the inner epiphyseal surface and free graft of the fibula gave excellent results. In three cases in which the femur was involved the lower part of the diaphysis and epiphysis was resected and the upper half of the fibula grafted. One patient died from shock. In another case an amputation was necessary on the eighth day owing to gangrene produced by popliteal thrombosis. The graft was found in good condition. The other patient is doing well.

W. A. BRENNAN.

**Marshall, J. C.: Osteoplastic Closure of Cavities in Bone.** *Brit. M. J.*, 1919, i, 759.

The frequency of bone sinuses following bone injury has made sequestromy one of the most common surgical procedures. In most instances this operation is attended with satisfactory results though the remaining bone cavity frequently gives rise to continued drainage and constitutes a condition which is of considerable clinical importance.



The author summarizes the main points in his discussion of the treatment as follows:

1. Filling bone cavities with "bipp" is in every case a successful method of treatment provided always that the preparation is thorough.

2. There are two types of cases: (1) the larger group, in which a sufficient thickness of soft tissues is present to cover the opening and simple filling is adequate; (2) the type in which no soft tissues can be placed over the opening which lies flush with the skin; these cases can be treated successfully by covering the opening with a skin-bone flap and filling the cavity with "bipp."

3. The advantages of the "bipp" method of treatment are: (1) less extensive disturbance of tissues than in any other operative procedure for closure of the cavity—no small consideration in war scars; (2) anatomical restoration of the bone with resulting strengthening rather than weakening; exposure of fresh osteogenetic surfaces; and (3) a good cosmetic result.

H. W. MEYERDING.

**Symonds, C. J.: The Treatment of Bone Sinuses by Solid Metal Drains.** *Lancet*, 1919, cxcvi, 971.

The author reported twenty-five years' experience in the treatment of sinuses in bones by means of both hollow and solid metal and glass drains, at a meeting of the London Medical Society. He called attention to the value of such drains in procuring satisfactory drainage in infective osteitis, especially when it is impossible to obliterate the cavity by disking it out. They may be left in place and reduced in size as necessary.

H. W. MEYERDING.

**Willems, C.: Immediate Active Mobilization in the Treatment of Gunshot Wounds of the Joints.** *Med. Rec.*, 1919, xcvi, 999.

Willem's treatment of purulent arthritis consists in very extensive bilateral longitudinal incisions into the joints followed by immediate active mobilization. In applying mobilization in the treatment of joint suppuration his first object was to obtain effective drainage. Whereas hitherto it has been impossible to drain a joint thoroughly, immediate active mobilization is a means as simple as it is efficacious in effecting such drainage after a simple arthrotomy.

Taking the knee-joint as an example, the author describes the way in which active movements assure drainage and emphasizes the following points: first, the necessity of making a long incision, passing beyond the level of the quadriceps cul-de-sac above and the articular line below; second, the necessity of keeping the incision constantly open throughout its whole extent and preventing union at the angles; third, the necessity of reaching the maximum excursion of the movements early. Ordinarily the longitudinal linear arthrotomy should be bilateral. A unilateral incision should be made only when the secretion is scanty. In such cases the external incision will be more efficacious. The horseshoe incision is strongly condemned.

In the case of the elbow bilateral arthrotomy is less often necessary, the external incision usually being sufficient unless the secretion is very abundant.

When treated by a wide incision and active mobilization a suppurative arthritis acts like an ordinary abscess. The suppuration is at first abundant, then gradually decreases to a few drops, and finally dries up.

The arthrotomy wounds early show a tendency to become the site of exuberant granulations which form voluminous masses rolling outward. These masses also press into the joint, becoming continuous with the synovial membrane which is red and presents an oedematous puffiness over the entire surface. This hides the borders of the cartilaginous surfaces, but the latter remain healthy and preserve their normal appearance for they are neither ulcerated nor detached. There is no evidence of involvement of the bone by the infection, which seems to be confined strictly to the synovial sac.

It is true that the knee swells, or remains swollen and assumes a globular aspect, but the enlargement is due in great measure to the tumefaction of the arthrotomy wounds. On palpation the peri-articular tissues are found to be soft and not infiltrated, and the contour of the bone is made out easily. The popliteal space especially preserves its normal suppleness and is not painful on pressure. In no case in which the method was applied vigorously and persevered in to the end was there a peri-articular abscess, which is the best proof that retention of the pus and extension of the infection are effectively prevented by this treatment.

The appearance and the quantity of the secretion vary according to the nature of the infecting micro-organism. In streptococcal arthritis suppuration is relatively slight in amount; the wound has a clean look and is covered with a glassy varnish of characteristic appearance. When other bacteria are present the pus may be abundant, thick, or stringy. On the granulating surfaces, areas of dried exudate form like that which glues the eyelids together in conjunctivitis. At the end of a variable but always a long time, the suppuration is reduced to an insignificant amount; pus no longer appears except in a few drops when extreme movements of flexion or extension are made.

The nature of the micro-organism seems to influence the duration of the suppurative process, the streptococcal infection lasting the longest, often for several months. Other things being equal, the cases in which suppuration is most profuse at the beginning are not those which last longest; on the contrary, the prolonged cases are those in which the suppuration is scanty and of a glassy appearance.

As the suppuration diminishes, the arthrotomy wounds shorten and union proceeds from the two angles until finally only a sort of fistula remains which closes and then re-opens from time to time to give exit to a few drops of serous fluid. Finally, cicatrization occurs and the wound is healed.



It is not advisable to let matters go as far as spontaneous closure of the wound for in his earlier cases, in which the author permitted this, he observed that from the moment the articulation dried up there was a tendency to articular stiffness. To prevent this condition the wound should be closed progressively by secondary suture. In practice, Willems now closes the incision which gives exit to the lesser amount of secretion as soon as the suppuration is noticeably reduced. Later he partially sutures the other wound in the section which serves least for drainage. After a certain period of drainage by active movements the discharge makes for itself a definite channel at one part of one of the incisions and it is here that the terminal fistula occurs. In taking the precaution to anticipate this process by partial suture Willems avoids stiffening the joint and reduces the duration of treatment. The secondary closure should not be attempted until the surgeon has acquired sufficient experience in the method and is able to determine exactly the opportune moment for the operation. The secondary closure gives a better cicatrix, permits suturing layer by layer, and prevents herniæ of the synovial membrane. These herniæ are encountered more frequently after purulent arthritis when spontaneous closure of the arthrotomy wound has occurred than after non-infectious lesions sutured in a more careful way.

Large and pliable cicatrices leave a relaxed articulation which sometimes results in a lack of the firmness in the joint which is so necessary for walking. This weakness is partly responsible for the effusion which sometimes occurs after complete closure of the wounds. Willem has observed that effusions, sometimes in large amounts, occur rapidly in formerly infected joints in patients who were cured after several weeks or months and had perfect mobility and marked absence of muscular atrophy. In some instances they follow a traumatism, as that resulting from a fall, but at other times they appear without any appreciable cause. Like all traumatic effusions, they are associated with a certain amount of pain and marked reduction in the extent of movement, especially in walking. When such effusions are evacuated by puncture, as in ordinary hæmarthrosis, the pain and functional weakness disappear at once. The fluid removed is serous, more or less clear and always sterile.

The author believes that the absence or presence of a peri-articular abscess indicates whether an infected joint is being well or badly drained. When the movements are insufficient or when the incisions are too short, the patient is apt to develop septic fever which falls as soon as perfect drainage of secretion is again assured. While then remaining very moderate, the fever usually persists for several weeks. Often, however, the entire course of the disease is almost completely apyretic. The patients walk about with their suppurating knees or elbows protected by simple small dressings, and have the appearance of perfect health.

The technique of the movements should be exactly the same in suppurative arthritis as in non-infected lesions; in both, the mobilization should be begun immediately after the arthrotomy. The mobilization ought to be active, done by the patient himself by simple contraction of his muscles. Passive movements should never be employed. The movements should be pushed to their extreme limits and repeated without interruption.

Mobilization should not be accompanied by any other method of drainage. Irrigation is absolutely forbidden. A small dressing, loosely applied, should be used and renewed as it becomes soiled. Premature cicatrization must be opposed by separating the edges of the wound daily by forceps grasping the skin. Never introduce the fingers or any instrument into the joint cavity. In cases of purulent arthritis of the knee the author allows his patients to walk even before cicatrization of the wounds. While not painful, the movements are laborious and at first are made with considerable effort. His experience has been that patients already gravely infected often hesitate to make the necessary effort for vigorous muscular contractions and that therefore it is necessary to place them under the care of someone whose sole duty it is to see that they do. The author is emphatic in repeating that in purulent arthritis immediate mobilization alone will give perfect functional results.

Pain does not exist except when pus is incompletely drained from the joint. The patients learn very rapidly to recognize the cause of the pain themselves and soon realize that the best way to stop it is to make more frequent and more extensive movements.

Toward the end of the cicatrization, closure of the wound may occur too soon and the signs of retention may appear. This may call for repeated puncture of the knee before the final closure of the wound. The author insists that puncture is always sufficient in these cases of terminal retention and that it is never necessary to resort to mechanotherapy.

Willem's method is applicable also in suppurative arthritis accompanied by bony lesions and when the ligaments of the joint are very largely destroyed. In cases of comminuted fractures of the epiphysis continued extension should be combined with mobilization.

Another condition in which the knee may be mobilized is purulent arthritis with extensive destruction of the soft parts of its anterior aspect. When suppuration has destroyed the crucial ligaments of the knee and resulted in posterior subluxation of the tibia, the active movements may be kept up if continued screw extension is applied to the leg.

The author concludes his article with the admonition that we should never be contented with partial success. In cases of purulent arthritis with extensive bony lesions conservation with well-conducted mobilization will give functional results infinitely superior to those of resection, but here the treatment is long and difficult. He who has the



courage to undertake it will have unhoped-for success which will well repay him for his trouble.

E. C. ROBITSHEK.

**Langworthy, M.: The Treatment of Joints Stiffened by War Injuries.** *J. Orthop. Surg.*, 1919, 1, 349.

The changes in the tissues, namely, the capsule, ligaments, muscles, and tendons, are those of scar formation and loss of substance or both.

The basis of treatment is gradual movement of the joint by a series of small movements which increase daily, starting always from the original position and followed by immobilization for about twenty-four hours in the new position.

The method described can be employed so gently and can be so easily graduated that the greater danger of lighting up latent infection is minimized. For this reason also it can be employed much earlier, which is a distinct advantage. The ability to return or resume the original position will not be lost. In other words, a knee which is stiff in complete extension and which is being flexed will not lose the power while regaining flexion to extend completely. The most valuable feature of this method is the relaxation of all tissues which takes place during the daily period of solid immobilization. This occurs to such an extent that the force necessary to increase the range of movement each day is minimized. The process really becomes a process of repeatedly taking up slack. Also it would seem probable that the short tissues are allowed time to grow longer; they are lengthened constructively rather than stretched destructively. There is, moreover, a psychical value which should not be underestimated. Observation by the patient of the daily improvement and the fact that he moves the limb with his own muscles from the starting point through a gradually increasing arc, undoubtedly shorten the duration of treatment. Thus also the method accomplishes a gradual re-education of muscles which have not been functioning. This is not nearly so easily accomplished after a forcible manipulation under anaesthesia, in which case the greatest desire of the patient is to prevent the pain which movement causes.

In treating a knee which is stiff in extension the knee is allowed to be its own hinge. A snug plaster cast is applied to the leg from just above the malleoli up to the point on the leg which touches the thigh when the knee is flexed to 90 degrees. Another cast is applied to the thigh as high as possible and down to the point which touches the calf when the knee is fully flexed. A piece of telephone wire is bent and incorporated in the plaster and caused to project at the back of the upper end of the leg cast so that the end of the board 3 inches wide laid against the back of the knee and pushed downward from above will be maintained about one inch below the edge of the upper end of the leg cast. A similar piece of wire is incorporated in the back of the thigh cast and caused to project half way

between the upper and lower edges so that the end of the board laid against this wire loop cannot progress upward. At the extreme upper edge of the thigh cast and at the lower edge of the leg cast posteriorly a wire is incorporated in the plaster and allowed to project as a small loop. A piece of small rope and the light board mentioned complete the materials necessary for beginning treatment.

The patient is placed face downward on a table. In the top of this table it is well to have cut two slots so that a wide strap can be placed over the thigh casts, through the slots, and anchored below for the purpose of holding the thigh on the table firmly. The ankle is then grasped around the malleoli and raised with the knee thus flexed, no matter how slightly, and the board marked so that it may be cut to fit between the two wire projections in the cast above and below the knee. At the time this measurement is made the thigh cast must be shoved as high as possible since it has a tendency to slip down because of the conical shape of the thigh. When the board is ready, the strip of webbing or rope is passed through the small loop at the lower end of the leg cast and the loop at the upper end of the thigh cast. The knee is then flexed as far as comfortable by lifting the foot. The board is slipped between its wire loops and the rope pulled tight and tied by an assistant.

The little board placed as directed prevents the thigh cast from slipping down, and because its upper end is anchored so high up on the thigh cast it also prevents the lower edge of the cast from pushing forward into the popliteal space. On the correct arrangement of this small piece of board and the wire loops which hold it hangs the entire efficiency and comfort of the apparatus. The next day the patient is again placed on the table, the rope is untied, and the board removed. The knee is passively extended and as much active flexion and extension as is possible is performed by the patient several times. This having been done, the knee is flexed as much as possible in the same way as at the beginning of treatment and the board is marked again to fit into its wire loops which, with the increase of flexion, will be approximated. When the board has been shortened, flexion is repeated, the board slipped in, and the rope tightened and tied as before. It is sometimes difficult to tie the rope so that some of the flexion is not lost. This may be remedied and the rope made as tight as desired by laying a sufficient number of small blocks of wood on the board to reach and tighten the rope.

It will be seen that this is not in itself a device for flexing the knee. It is rather a means for immobilizing the knee in the position in which it is placed by the operator.

Flexion of an elbow stiff in extension is accomplished in exactly the same way, the arm being prepared as is the thigh, and the forearm as is the leg.

Following the same method the author treats contractures of other joints. L. C. DONNELLY.



**Pennell, V.: Tendon Transplantation in Drop-Wrist Due to Nervous Injury.** *Brit. M. J.*, 1919, i, 704.

The author gives the following indications for tendon transplantation at the wrist-joint: (1) severance with large loss of substance of the musculospiral nerve; (2) severance of the musculospiral nerve with much bony injury and prolonged suppuration; (3) when very rapid and complete wasting of extensor muscles has supervened; (4) in all cases of division of the posterior interosseus nerve.

In severance of the posterior interosseus nerve just below the midpoint of the forearm the author detaches the supinator longus at its intersection and joins it with the extensor ossis metacarpi pollicis and the extensor carpi radialis longior with the common digital extensors or the extensor longus pollicis if the finger extensors are spared.

In complete musculospiral paralysis the use of the hand is lost, due to the fact that the fingers cannot be closed until the hand is put in slight extension. This has led to the fixation of the wrist or support in the latter position by means of a ligament made of fascia lata. The fascia may be attached to the third and fourth metacarpals and to the radius and ulna, and the flexor carpi radialis anastomosed to the extensor communis digitorum or the pronator quadratus. In addition, the palmaris longus may be anastomosed to the extensor ossis metacarpi pollicis to aid in thumb abduction.

The author does not favor the transfer of the flexor carpi ulnaris and radialis to the extensor carpi ulnaris and radialis longior. Attention is called to the necessity for strict asepsis, correct alignment of the tendons, early movement, and re-education of the transplanted muscles. The author's conclusions are based upon the observation on twelve cases in which an operation was performed with favorable results.

H. W. MEYERDING.

**Verrall, P. J.: Stiff Fingers; with Special Reference to Methods of Treatment by Metal and Plaster Splints.** *J. Orthop. Surg.*, 1919, i, 335.

Stiffness of the fingers may be due to loss of extension, loss of flexion, or both, but at any given time treatment should be directed mainly to one or the other.

Loss of extension is commonly due to (1) contracture of the muscle, traumatic, ischæmic, or postural; (2) adhesions of the tendons to the skin or other structures; (3) peri- or intra-articular adhesions; and (4) nerve lesions of the ulnar or median nerves.

Loss of flexion may be due to (1) involvement of the extensor tendons in scar or callus, especially in wounds of the metacarpal region; (2) adhesions of the flexor tendons to scars; (3) peri- or intra-articular adhesions; and (4) traumatic or postural contracture of the muscles.

Tendons tightly bound down by scar tissue should be freed by operation and the scar removed. Those adherent to the skin only may be successfully

treated by massage or, if this fails or is too tedious, by excision of the scar. Short tendons should be stretched as much as possible before operative lengthening is attempted.

Tendon grafts are not so successful on the flexor aspect of the hand as on the dorsum.

Cases of extension scars on the dorsum of the hand with destruction of the extensor tendons and perhaps metacarpal fractures are frequent. A successful method of treatment consists of excising the scar and bringing the skin together without any effort to unite the tendons. After the wound is healed gentle massage will prevent adhesions of the cicatrix to the deeper structures. At a second operation strips of fascia lata about 5 mm. wide are sutured to both ends of the tendons and in this way the gap is bridged. Movement is begun early.

A few types of stiff fingers are described to illustrate the methods.

1. Fingers flexed with wrist dorsiflexed; extension possible with wrist flexed. This is the type of ischæmic contraction which is due to shortening of the flexor tendons. It is treated by the use of the Jones splint applied to the flexor aspect and beginning at the distal joint. Each joint is left in the deformed position until all the joints distal to it are corrected. Constriction must be avoided. The tendon bound down by the scar must be relieved by operation.

2. Wrist movement free; one or more fingers flexed at all three joints; contraction unaffected by the position of the wrist. For the treatment of this condition, which should consist of extension without loss of flexion, the author has devised a metal splint which is held to the dorsal surface of the hand and forearm by plaster of Paris. This splint is 16 inches long,  $\frac{1}{2}$  inch wide and  $\frac{1}{8}$  inch thick and terminates in a triangular loop. The transverse bar of the triangle is 4 inches long. To follow the bend of the partially dorsiflexed wrist the axial bar is curved. A small thin bar placed transversely prevents the splint from rotating. The terminal triangle is curved slightly toward the palmar surface. The hand and forearm are first encased in felt through which the thumb protrudes. Over this, the splint is applied, and over the splint a plaster cast extending down to the level of the neck of the metacarpals. At the end of twenty-four hours when the cast has hardened adhesive plaster is applied so as to encase the two distal phalanges of each finger and leave a loop at the end of the finger. The method of cutting the plaster is illustrated by a diagram. Through the loops tapes are passed and tied to the transverse bar of the triangle. As extension improves these are gradually tightened. The tapes are untied every day, the fingers flexed to their original position several times, actively and passively, and the tapes retied.

The treatment of fingers stiff in extension is along similar lines except that the splint is modified somewhat and applied to the anterior (flexor) surface.

J. J. KURLANDER.



**Nutter, J. A.: Arthrodesis of the Hip-Joint and Its Indications.** *Canadian M. Ass. J.*, 1919, ix, 548.

The author discusses briefly the anterior route of approach to the hip-joint and describes the posterolateral route as follows: "The incision is from the anterior-superior spine downward and backward to the great trochanter; then directly downward along the femur for 2 inches, with a short backward incision where the two first incisions meet. The tensor fasciæ femoris and the gluteus medius are separated, the fascial expansion of the gluteus maximus is cut through in the line of the posterior incision, and the great trochanter, with its many muscular attachments, is exposed. The other part of the great trochanter is then chiseled free, carrying with it the gluteus and other muscles which overlies the femoral neck and head. After reflecting these upward and backward the joint capsule is exposed." In closing, the trochanter is wired into place. A spica is applied with the leg in abduction to remain several months.

Arthrodesis of the hip-joint is indicated especially in:

1. Monarticular hypertrophic arthritis of the hip-joint, particularly in working people who need a straight weight-bearing leg.

2. Deformity with or without pain in adults following hip-joint disease of childhood in which ankylosis is not complete. In these cases arthrodesis removes the pain, the deformity, and the possibility of return to activity of the joint focus.

3. Deformity with incomplete ankylosis after acute infectious arthritis of the hip, e. g., gonorrhœal arthritis.

4. Traumatic conditions and old fractures of the femoral neck.

K. L. VEHE.

**Ogilvy, C.: An Operation for the Permanent Correction of Weak Feet in Children.** *J. Orthop. Surg.*, 1919, i, 343.

In these cases there is an abnormal eversion of the feet. The correction is obtained by inverting them and keeping them inverted. This may be done by raising the inner border of the heel of the shoe or both the inner border of the sole and the heel. A metal plate or arch support worn inside the shoe is used by many to accomplish the same end. However after treatment has been continued for several years and these correcting shoes or arch supports have been removed, it will be seen that the eversion originally present still persists. This is true of cases that have been under the author's care for four or five years. It is found that the point of greatest relaxation is at the astragalonavicular joint. Here there is a ball-and-socket joint upon which the fore-foot pivots. When the toes are turned outward the strain upon this joint is increased and is followed by increasing relaxation of the joint ligaments. The head of the astragalus rotates downward and inward. This articulation is the site of the greatest strain.

For the permanent correction of this condition the author produces an arthrodesis of the astragalo-scapoid joint. After this the foot is put up in a plaster cast in marked inversion, care being taken to exaggerate the varus.

The cast is worn from five to six weeks at the end of which time the foot will be found to be in over-corrected inversion. This will gradually disappear until at the end of three months from the time of the operation the patient will be able to walk with ease and comfort. It is well to keep the inner border of the heels raised  $\frac{1}{4}$  of an inch for a year after operation.

The operation should not be performed before the patient is eight years of age.

J. J. KURLANDER.

**Zeuch, L. H.: The Robert Jones Operation for Talipes Equinovarus.** *Illinois M. J.*, 1919, xxxv, 241.

The indications for the Robert Jones operation for talipes equinovarus are: (1) a slight to moderate degree of claw-foot, due to transient paralysis of the short flexors; (2) talipes equinovarus with marked inversion of the foot; and (3) foot-drop due to infantile paralysis.

For marked contraction of the tendo achillis which accompanies these deformities, Jones advises subcutaneous tenotomy. The open method is recommended as it is more accurate and poor results practically never follow. The author used the open method according to Anderson. Tenotomy relieves the flexion, but not the extreme inversion of the foot. To accomplish this, Jones shortens the extensor proprius hallucis by implanting it into the first metatarsal bone.

The technique is as follows: A 2-inch incision is made over the tendon near its insertion into the first phalanx of the great toe and the tendon exposed, clamped, and cut close to its insertion. A long catgut suture is then threaded through the distal end of the tendon and drawn through a drill hole in the head of the metatarsal bone. This is facilitated by making a small counter-incision from the planter surface. The tendon is then sutured to the plantar fascia, the union being re-inforced by a suture passed through the periosteum, tendon, and periosteum on the opposite side.

By the severing of the tendon, the toe becomes superflexed, but this is partially compensated by the short extensor of the great toe. The end-results are good. Following the operation the foot is held in a cast in the over-corrected position for three weeks. At the end of this time the cast, which is worn until there is firm union, is removed daily to permit gentle massage of the foot. The patient is allowed to walk after six weeks, and if there is any tendency to inversion, a brace is applied.

The results are good whether the condition is congenital or due to infantile paralysis or spasticity.

J. J. KURLANDER.



## SURGERY OF THE SPINAL COLUMN AND CORD

**McMechan, F. H.:** Laminectomy under Local and Regional Procaine Anæsthesia. *Am. J. Clin. Med.*, 1919, xxvi, 416.

In this article the author has endeavored to show the scope and utility of procaine anæsthesia by quoting from the current literature on the subject. He believes that shock and hæmorrhage, which are the chief causes of death in laminectomy, may be reduced to a negligible minimum under appropriate local and regional anæsthesia.

Points in the surgical technique emphasized by McMechan are: (1) ample exposure; (2) X-ray identification of at least one lamina before beginning the operation; (3) coffer-damming the spaces on either side of the dural flaps with cotton; (4) gentle manipulation of the cord or roots, and the stovaine block as a prophylactic against shock; (5) minute closure of the dural incision with fine needles and silk; and (6) careful juxtaposition of each layer—muscle, muscle-sheath, intervertebral aponeurosis, and superficial fascia. E. C. ROBITSHEK.

**Adson, A. W.:** Results of the Surgical Treatment of Spinal-Cord Tumors. *Minnesota Med.*, 1919, ii, 205.

The author believes that all too frequently patients suffering from a spastic paraplegia are given a diagnosis of transverse myelitis, sclerosis, or lues without a thorough neurological examination and thus are deprived of surgical treatment. He notes that the history of symptoms in cases of spinal cord tumors is not always constant but usually is

suggestive. The onset is gradual, generally beginning with sensory changes, but is soon accompanied by motor disturbances. The symptomatology grows progressively worse even though there are periods of slight improvement. The characteristic neurological findings are the sensory level, i. e., the partial or complete loss of pain, tactile and temperature senses at the level of and below the involved segment of the spinal cord, exaggerated reflexes, and motor disturbances with or without root pain. The tumors are situated at three levels, the extradural, subdural but not intramedullary, and intramedullary. The pathologic tissues of spinal-cord tumors vary, but 75 per cent are non-malignant and from 50 to 60 per cent are removable.

The results reported in the article were obtained from a series of sixteen laminectomies performed for spinal-cord lesions at the Mayo Clinic in 1917. Thirteen of the patients had tumors and three had meningomyelitis. Eight of the thirteen tumors were removed completely; five of them were psammomata, one a glioma, one a fibroma, and one an angioma. Of the five non-removable tumors, two were intramedullary, one an angioma, one a gumma, and one a unilateral inflammatory mass. Twenty-five per cent of the patients recovered during the year after operation, 18.75 per cent are greatly improved, 25 per cent slightly improved, 8.75 per cent not improved. One patient died. Therefore 68.75 per cent recovered and were benefited while 31.25 per cent, including the patient who died, were not benefited.

## SURGERY OF THE NERVOUS SYSTEM

**Burrow, J. L.:** War Lesions of Peripheral Nerves. *Med. Rec.*, 1919, xcv, 904.

The report is based on a study of over 15,000 routine examinations of lesions of the nervous system.

In direct injury of a nerve trunk there may be (1) complete division of the nerve, (2) total division of only a few fibers, (3) injury to the nerve sheath alone, or (4) bruising of the nerve trunks.

Complete division of the nerve is rarely seen in cases of bullet wounds in large nerves. Exposure after a few weeks reveals a dense fibrous swelling in the center of the nerve trunk where the bundles have been cut across. When due to shrapnel or metal fragments there is more laceration and dense fibrosis. If the division has been complete and the ends separated, a large soft swelling is seen at the proximal end and a smaller harder one at the peripheral end.

In total division of only a few fibers a lateral neuroma develops, varying in appearance with the degree of infection present. Young vascular fibrous

tissue spreads widely about the area after a few weeks of sepsis. When clean, there is a sharply defined lateral swelling consisting of fibrous tissue, varicose vein fibrils, and remnants of degenerated nerve fibers. On the uninjured side of the nerve healthy fibers pass over the swelling into the peripheral end.

In cases of injury to the nerve sheath only, the pathology observed at operation may appear slight to the naked eye. On opening the sheath a few strands of young fibrous tissue are seen entering the nerve bundles separating them and causing torsion in their course. The local thickening may suggest a lateral traumatic fibroneuroma.

Bruising of nerve trunks is due to injury of structures closely associated with the nerve and occurs usually after explosions as in cases of "nerve concussion." Many of those so injured return to duty in a few days. Others develop numbness along the affected nerves or even the typical syndrome of causalgia. The exact pathology in these cases has not been



carefully observed, but microscopically an intraneural fibrosis has been made out where to the naked eye the nerve appeared little damaged.

Indirect injury to nerve trunks may be caused by displaced bone fragments or constriction by callus or organized blood-clots.

Injury by displaced bone fragments is very common. The nerves involved are chiefly the musculospiral and external popliteal nerves. The cut ends may be widely separated and either embedded in bone or dense scar tissue or bulbed at either end.

In constriction of nerves from callus or organized blood-clots three phases may be noted. In the early phase there are signs of bruising or a partial lesion. Later, there is a stage of irritation pressure, and finally, progressive loss of function due to Wallerian degeneration.

Fibrosis following intense suppuration, "ischaemic paralysis," is often difficult to diagnose and treat, especially in the acute stage. The problem is to determine how much is due to vascular and how much to actual nerve injury. The pathologic study of a few cases has revealed Wallerian degeneration as a result of local necrosis by infection or constriction during repair.

The system employed as a routine to arrive at a diagnosis in injuries to the nerves is as follows:

1. Preliminary notes with regard to the nature of the injury, the patient's posture when injured, the immediate effects, and the results of treatment.

2. Examination of the injured part with regard to the position of the wounds and scars, the attitude of the two limbs, contractures, mobility of the joints, the degree of atrophy, trophic skin changes, the condition of the hair, vasomotor changes, sudomotor changes, and the condition of the nails.

3. Palpation of scars to determine the presence of induration, nodules, or neuromata; of nerve trunks, to determine the nature of the sensation produced in the region supplied by the nerve; of the joints, to determine the degree of ankylosis; and of the muscles and tendons individually to avoid mimicry by healthy structures and to determine the degree of tone and pain on pressure. In addition, percussion is applied to the muscle bellies to observe the nature of the response to mechanical stimulation.

4. Investigation in regard to the response to sensory stimuli. In this examination care is taken to have the limbs thoroughly warmed and the stimuli standardized. The stimuli used are as follows: (1) light touch, using a small, soft, camel's hair brush and charting areas of complete and partial anaesthesia; (2) pin-prick, using the spring algometer devised by Head and Holmes by which the degree of pressure can be standardized; (3) movement of joints and deep pressure on muscles and bones to determine deep sensibility; (4) deep pressure on the skin with the blunt end of a pencil to determine pressure sensations (an algometer is essential to gauge progress during regeneration); (5) thermal stimuli with the use of nickel silver test tubes which taper to a small blunt point, Goldstein's pointed solid metal

cylinders, or a moderately thick copper wire; (6) Weber's test to determine the recognition of two blunted points of a compass applied simultaneously to the skin in the long axis of the limb, a function associated with deep pressure sensation; (7) vibration by means of a tuning fork placed at right angles to the long axis of the bone to determine the vibration sense in bones, etc.; (8) tests to determine the discriminating sensibility which involves distinguishing the size and shape of common objects placed in the hands; and (9) electrical stimuli, using a rapidly interrupted current of short duration and a slowly interrupted constant current, the skin being warm and moist.

It has been noted that sensations of pain, heat, and cold are intimately bound together. The author illustrates by a diagram the sensory picture in a case of unilateral lesion of the cord which produced the Brown-Sequard syndrome.

For measurements of the currents for electrical stimulation, the Lewis-Jones condenser set has been used considerably but is less satisfactory than an electrodiagnostic method which relies upon averages or the character of the muscular contractions.

In complete loss of function in a nerve trunk there is complete flaccid paralysis of the affected muscles followed by atrophy and possibly by contracture. Also observed are arthritic changes and alteration of the joint axes with contracture. Definite groups of muscles are affected and there is increased mechanical excitability on direct percussion. The tender reflexes are abolished. The skin is dry, scaly and "branny," reddish-blue in color, and in cold weather, swollen, cyanosed, and liable to chilblains. The hair resembles a corn field after a heavy rainstorm. Goose skin reflexes are absent. The nails are brittle, dry, curved, and ridged. On palpation of the nerves, swelling may be detected at the site of injury. Tinel's sign is absent. An area of loss of light touch and pin-prick sensation is surrounded by a large zone of hypoaesthesia. Thermanaesthesia corresponds closely to the loss of the sensation of sharpness. The area of deep sensibility varies with each nerve. A few weeks after injury the typical reaction of degeneration to electrical stimulation is seen. A slight and persistent briskness in the galvanic response may be accounted for by the presence of a few healthy nerve fibers.

A total lesion which shows no evidence of regeneration after twelve weeks should be operated upon at once. Good sized gaps after resection may be bridged by autogenous nerve grafts.

To improve local circulation after operation the use of electrotherapy is of value; also daily massage and movement of neighboring joints. In addition, interrupted galvanism should be applied to each paralyzed nerve separately. At the first sign of voluntary power the electrical stimulation should be stopped and active exercises substituted to re-educate the muscle movements. Later the patient should be given scientifically arranged exercises in a curative workshop.



In cases of incomplete lesions the signs and symptoms of a complete lesion may be present during the first two weeks although there is some pain, a bruised feeling under the skin, and partial preservation of the deep sensibility. After the second week the signs of a partial lesion are definite.

If the improvement is progressive the use of massage, electricity, and re-education is sufficient. When improvement is arrested for two months surgical intervention is indicated. The healthy motor fibers may be picked out at operation by the application of a small sterile electrode and the use of a weak faradic current.

All cases showing irritative phenomena are cases of partial lesion. The main causative factor is fibrosis of the nerve trunk. The signs which appear after the fourteenth day vary with the extent of the injury. The whole picture results from irritation at the central end of an injured portion of the nerve which results reflexly in the various vasomotor and trophic changes. There is intensive pain and burning, aggravated by heat and relieved by cold, which often wrecks the patient mentally.

Cases of minor causalgia may clear up in a few weeks. If not improved in eight weeks, surgical interference is indicated. If the signs of increasing compression appear, operation is advisable at once.

Excision of the affected portion of the nerve with end-to-end suture or bridging of the gap by nerve graft is safest. Local injections of alcohol are of only temporary benefit.

The signs and symptoms of regeneration are described as follows: Within a month after nerve suture the skin assumes a healthy color. Desquamation becomes normal and the nails become soft and pliable. Trophic sores heal quickly. Within two months Tinel's sign is noted at increasingly lower levels. Later the deep sensations gradually return and are soon followed by sweating and the skin sensations to coarse stimulation. The return of voluntary muscle control depends on the nerve involved and varies from six to eighteen months. Pilomotor functions are late in appearing, being dependent on a variety of skin sensations. The ability to discriminate various skin stimuli is the last function to recover.

Peripheral nerve injury may be simulated by a number of conditions, chief of which are: (1) traumatic contractures (Volkmann's "ischæmic paralysis"); (2) organic paralysis of the upper motor neurone type, e.g., a Brown-Sequard syndrome; (3) poliomyelitis, acute infective polyneuritis, etc.; (4) pithiatric (hysterical) paralysis or contractures; (5) physiopathic contracture (reflex paralysis of Babinski and Froment); (6) paresis and muscular atrophy associated with joint lesions; (7) contractures associated with painful scars and due to direct injury to muscles and tendons; (8) purely functional conditions due to bad muscle habit or incoördination of muscles formerly paralyzed; and (9) chronic tetanus.

E. M. MILLER.

**Hammond, T. E.: The Non-Operative Treatment of Nerve Lesions Involving the Upper Extremity.** *J. Orthop. Surg.*, 1919, i, 320.

The position of physiological rest of the upper extremity has added much to medical knowledge. In this position the elbow is flexed at 120 degrees and the shoulder abducted at 15 degrees and inwardly rotated. The hands are held midway between pronation and supination to lessen the effect of gravity on the fingers. The wrist is dorsiflexed 45 degrees, with the fingers flexed 20 degrees at the metacarpal and midphalangeal joints and 5 degrees at the distal joints. The thumb is abducted 30 degrees in a plane at right angles to the palm and is flexed at 20 degrees at both the metacarpal and interphalangeal joints. With the hand in this position the plane of the anterior surface of the forearm passes half an inch below the tips of the fingers and a line continuing forward to the radial border of the forearm passes longitudinally through the thumb.

The position of physiological rest is maintained by muscle tone, by which is meant a slight, continuous, involuntary contraction dependent on a reflex arc with a center in the cord and afferent fibers from the ligaments and tendons and efferent fibers to the muscles.

By relaxation is meant placing a muscle in its normal position of rest so that no strain is thrown upon it.

When one group of muscles is hyper-relaxed the antagonistic group of muscles must be contracted. If this position were maintained in the normal hand for some time, the stretching of the muscles would give rise to paresis and the chronic strain on the ligaments to chronic inflammation and adhesions. In nerve lesions the nutrition of the tissues is impaired, paresis and adhesions following the slightest strain. In powerful muscles associated with the grosser movements the paresis is of little consequence and soon disappears. In the hand the slightest adhesions impair function.

If the hand were kept in the position of rest for several weeks no discomfort would result and on removal of the splint full forcible contraction of the muscles could immediately take place. The position of physiological rest is the only position in which paralyzed muscles can be placed without stretching the opposing group.

Hyper-relaxation is bad as it stretches the opposing muscles and ligaments and gives rise to paresis and adhesions.

In lesions of the musculospiral, median, or ulnar nerves the hand should always be placed in the position of physiological rest, the arches being carefully preserved in all cases.

The object of treatment is to increase the circulation, to improve the nutrition, and to prevent the formation of adhesions.

It is most beneficial to obtain a good circulation in the limb before the application of massage. In all nerve lesions of the upper limb a daily gymnastic



course is advisable unless there is some contraindication such as active inflammation.

Muscles which are recovering function are easily tired. As soon as the contraction shows signs of diminishing the muscle should be immediately relaxed and massaged. Voluntary contraction of the muscles should be encouraged provided the paralyzed muscles are not stretched.

Much harm may be done to a muscle if it is stimulated after the onset of fatigue. As soon as the contraction to a given current begins to diminish the current should not be increased; electrical treatment should be stopped and massage substituted.

When ligaments are stretched chronic strain arises at the attachments; this gives rise to chronic reflex vasomotor changes, chronic inflammation, and the formation of adhesions.

The author describes the short and long cock-up splint to be used to maintain the position of physiological rest. This splint should be worn until all tendencies to recurrence of the contractions have been absent for six weeks and even then its use should be continued for six months longer. Heat, vibration, and massage are of value in restoring function.

L. C. DONNELLY.

**Platt, H., and Brentnall, E. S.: Faradic Stimulation of Nerve and Muscle During Operations.** *Lancet*, 1919, cxcvi, 884.

Observations were made in 340 operations on peripheral nerves in which faradic stimulation rendered possible the identification of each branch exposed and the confirmation of its physiological integrity. When during operation a nerve is accidentally cut, a nerve trunk is found displaced far from its bed, an end-to-end anastomosis can be effected only after division of one or more proximal branches of the nerve because of retraction, or a nerve is gathered and concealed in a mass of adhesions, the only method of positively locating the nerves involved is by the faradic current.

The current is applied by the bipolar method in preference to the unipolar method. Two small surgical probes sharpened down to fine points at one end are covered with rubber tubing and bound together with a small wooden wedge between them. To these the wire is attached and the whole boiled and thoroughly dried. The current used is of minimal strength.

P. W. SWEET.

**Standage, R. F.: Tendon Transplantation and Fixation for Nerve Injuries.** *Indian M. Gaz.*, 1919, liv, 161.

The selection of the proper treatment in cases of nerve injury and the resulting paralysis has been guided by a consideration of the surgical possibilities and the station in life of each patient, his necessity for a perfect result, and his ability to get proper after-treatment and efficient apparatus.

In the author's opinion tendon transplantation is the operation of choice in certain disabilities due to

severance of a nerve trunk, especially in the paralysis due to division of the musculospiral nerve. In this latter type useful hands can be obtained in from two to three months by tendon transplantation while nerve repair gives a doubtful prognosis and requires about one or two years of persistent and careful after-treatment.

Tendon transplantation has been carried out in: (1) irreparable injury to the musculospiral nerve with wrist-drop; (2) similar injury to the median nerve; (3) injury to the musculocutaneous nerve in the leg with paralysis of the peronei muscles and resulting pes equinovarus.

For paralysis of the musculospiral nerve the following transplantations are done:

1. The pronator radii teres, detached from its radial insertion, is transplanted into the long and short radial extensors.

2. The flexor carpi radialis tendon, divided at the wrist, is brought around the radius, over the wrist extensors, and transplanted into the tendons of the extensores ossi metacarpi, primi and secundi inter-nodii pollicis, and the extensor indicis.

3. The flexor carpi ulnaris tendon, divided at the wrist, is brought round the ulna and transplanted into the tendons of the extensor carpi ulnaris and the extensors of the three inner fingers.

For irreparable injury of the median nerve the Robert Jones' method is used. This consists in implanting the paralyzed portion of the deep flexor into its normal portion which is supplied by the ulnar nerve by transplanting the flexor carpi ulnaris into the flexor sublimis digitorum and uniting the extensor carpi radialis longior to the flexor longus pollicis.

Instead of transplanting the tibialis anticus from the inner to the outer side of the foot in musculocutaneous nerve injuries the author transplants the tendon of the peroneus longus into the tibialis anticus. This makes the latter a bifid muscle which permits the foot to be flat on the ground.

Irreparable injury of the external popliteal nerve and consequent drop-foot are treated by fixing the long peroneal tendon through a hole drilled in the tibia and making a loop to which is attached the lower end of the divided tibialis anticus.

Irreparable complete lesions of the sciatic nerve are treated by a series of operations as follows: (1) lengthening of the tendo achillis, (2) fixation of the peroneus longus and tibialis anticus to the tibia as described, (3) tenotomy of the hamstrings, and (4) resection of the knee to produce a stiff joint.

The ulnar nerve responds well to reparative surgery. This is fortunate as its lesions are crippling and cannot be repaired by tenoplastics. K. L. VEHE.

**Stookey, B., and Guild, S.: A Method of Exposing the Musculospiral and the Posterior Interoscious Nerves.** *Surg., Gynec. & Obs.*, 1919, xxviii, 612.

The spiral incision usually employed for complete exposure of the musculospiral nerve is unsatisfactory because extensive dissection may be necessary to



locate the nerve, the triceps muscle must be cut, and the nerve is apt to be involved in the cutaneous scar.

The author describes the three following incisions for exposure of the nerve from the lower border of the *teres major* muscle to the antecubital fossa:

The first incision lies in a line from the tip of the olecranon to the posterior angle of the acromion. It is begun three finger-breadths below the acromion and extends to 5 centimeters below the level of the deltoid insertion, going through the deep fascia. At the upper angle the long and outer heads of the *triceps* are separated bluntly in their fascial planes down to the lower angle of the wound. The aponeurosis presenting is incised, thus exposing the nerve up to the lower border of the tendon of the *teres major*.

The second incision runs parallel to the first except for a slight anterior curve at the lower end. It begins 12 centimeters above the antecubital fossa external to the *brachialis anticus*, following the interspace between it and the *supinator longus* in which the lower one-third of the nerve is found. By following the course of the nerve beneath the *triceps* and through the intermuscular septum a groove may be opened in which the severed ends of the nerve may be united without further dissection.

If a more complete exposure is necessary a third

incision may be made midway between the other two, parallel to the first, extending from 3 centimeters above the level of the deltoid insertion directly downward for 12 centimeters, and carried through the *triceps* longitudinally. This third skin incision may be omitted if either of the first two is prolonged in an oblique or curved direction and the skin edges undermined.

All of these incisions give good exposure of the nerve and preserve the sensory skin supply.

The posterior interosseous nerve, the injury of which causes paralysis of the extensors of the thumb and fingers, may be exposed through an incision 12 centimeters long extending from the external condyle downward between the *extensor communis digitorum* and the *extensors carpi radialis* through the deep fascia. These muscles are separated bluntly up to their common origin. Here the fibers are cut longitudinally up to the external condyle and retracted, exposing the *supinator brevis*. At a point two finger-breadths below the condyle its fibers are separated bluntly, exposing the posterior interosseous nerve running at right angles to the muscle.

It should be a principle of nerve surgery never to attempt an incision parallel to a nerve having a spiral course.

E. M. MILLER.

## MISCELLANEOUS

### CLINICAL ENTITIES—TUMORS, ULCERS, ABCESES, ETC.

**Quénu, E.: Traumatic Toxæmia with Depressive Syndrome (Traumatic Shock) in War Wounds**  
(De la toxémie traumatique à syndrome dépressif (shock traumatique) dans des blessures de guerre).  
*Rev. de chir.*, 1918, lvi, 204.

The so-called traumatic shock of war wounds, according to Quénu, is a chemical intoxication of the tissues. In 1917 he first showed that this shock did not appear as early as it would if it had a nerve origin, that it preceded the formation of bacterial products, and that since it was not of nerve or septic origin some other cause of its appearance must be sought.

A rapid amelioration of the symptoms after early amputation in shocked patients, and the finding of shock with special frequency in those with injuries causing vast destruction of the muscles, were factors indicating that the source of traumatic shock observed in the wounded lies in the wound itself. The syndrome called shock, therefore, may be engendered by an intoxication and there may be a variety of toxic shock quite apart from that which occurs in extensive hæmorrhages, nervous shock, and the shock observed in the course of septicæmia.

Immediate shock, according to Quénu, results only in severe hæmorrhages or when abdominal wounds are complicated with effusion of the stomach or intestinal contents into the abdomen. He is satis-

fied that both experimental research and clinical observation have shown that the traumatic destruction or amputation of a limb by a war projectile or similar injury does not produce immediate shock. Primary shock is that which is generally observed within the first few hours after injury.

In the chapter on pathogenesis a number of cases and facts are cited in favor of the theory that shock is due to a tissue intoxication. Quénu claims to have been the first to establish this theory solidly on a clinical basis.

Abdominal injuries offer particularly favorable conditions for the early development of intoxication of the tissues. This intoxication is purely chemical and is due to toxins of non-bacterial origin which result from rapid muscular proteolysis.

The conclusions reached by American authors and by Cannon in particular agree with those of Delbet and the author in regard to the causes of shock and of the succession of the different phenomena, the origin of which is resorption in the area of the injured muscular tissues. The nature and the genesis of the toxins generated in this area, however, are still matters for exact determination in the laboratory and by biological research. Certain studies already made show that in shocked patients there is a disturbance in the nitrogenous and carbohydrate metabolism and suggest some alteration in the hepatic function. Delbet has shown that the toxins of muscular autolysates are poisons which especially affect the nervous system.



Quénu believes that the term "traumatic shock" is a misnomer and prefers to call the condition "traumatic toxæmia."

The last chapter of the article is devoted to the treatment especially the value of blood transfusion. On the basis of the new theories as to the nature of shock, it logically follows that operation should not be avoided and that it is best to destroy the source of the toxins and thus obviate the intoxication due to absorption. In the case of a limb, sacrifice of the member may be necessary. A number of cases are cited from published reports in which shock rapidly disappeared after an amputation.

In Quénu's opinion operation should be performed as quickly as possible in order to prevent the elaboration of toxic products and their dissemination.

W. A. BRENNAN.

**Cannon, W. B.: Wound Shock.** *Mil. Surgeon*, 1919, xlv, 494.

This paper was a lecture to the officers of the Army Sanitary School at Langres, France, and was based upon studies at the Laboratory of Surgical Research, A. E. F., Dijon.

Wound shock is the same in all wounds of certain kinds, whether due to accidents in civil life or war injuries. Such cases exhibit, beside the local wound, a general bodily state, the state of shock, which is characterized as follows: the patient is cold, sweating, listless, and occasionally restless; the respiration is shallow, the pulse-rate rapid, the blood pressure low, and the skin pale. The most outstanding feature of this significant group of symptoms called "shock" is the low blood-pressure.

The theories to account for shock have been many. Reference is made to the following:

1. The low blood-pressure is due to exhaustion of the vasomotor center with relaxation of the arterioles. This view was held by Mitchell, Keen, and Morehouse at the time of the Civil War and is supported by Crile on the basis of observations upon nerve cells in cases of shock. Such nerve cells were subjected to low blood-pressure for a considerable time before the observations. As we know that of all tissue cells the nerve cells are the most sensitive to a lack of blood supply (temporary retardation of blood flow to the brain causes fainting), the question arises as to whether the nerve-cell changes are not the cause rather than a mere effect of low pressure.

2. Another theory, with considerable recent support, attributes shock to a liberation of fat, particularly in fractures of long bones, which produces pulmonary embolism. The result of such emboli in the lungs is assumed to be a decrease in the blood-supply from the right to the left heart and hence a fall of arterial pressure with its effects. Not debating that fat is liberated into the blood-stream, the author states that the anatomy of the lung shows ample capacity of the vessels there to supply the left heart in spite of the presence of massive emboli; indeed, half the lung area may be

removed without interfering with the circulation. Furthermore, the symptoms of fat emboli sufficient for circulatory disturbance (apnoea, etc.), are not seen in shock and the blocking of the circulation in the right heart with the resulting congestion in the systemic veins is also absent. In shock a needle finds the superficial veins with unusual difficulty because they are so collapsed. Finally, the approved treatment for shock, transfusion of blood, which has beneficial effects, is exactly contrary to indications if the cause be pulmonary embolism and venous congestion.

3. A third theory assumes that there is a loss of CO<sub>2</sub> from the circulating blood (the "acapnia" of Henderson) and that it is to this that the fall of blood-pressure is due. Pain is said to be the initial cause of the rapid breathing and the loss of CO<sub>2</sub>, but in shock both the pain and this characteristic breathing are commonly absent. Hence this theory, like the others mentioned, lacks convincing proof.

4. Old observations made with no thought of shock in mind found that the first products of proteid digestion, the proteoses and peptones, are extremely toxic. These injected into the circulation will produce "peptone shock." Certain "lymphagogues" are known to act by so changing the capillary walls that the lymph escapes in increased amount. It is known also that injured tissue cells undergo digestion into products similar to those of normal digestion. Would not, therefore, a wound with its great tissue destruction be a source of toxic products causing increased permeability of capillary walls, a fall of blood-pressure, and constitutional changes? Records of experiments bearing on this are given.

A case of injury to the leg followed by pressure resulted in fatal shock which was not due to hæmorrhage. Another case, exactly similar, in which clips were placed on the blood vessels for thirty-five minutes after the injury, thus preventing the absorption of toxins, showed no fall of pressure, but promptly after the removal of the clips the pressure fell back to shock level. As before the injury the nerves to the leg had all been cut, connection with the central nervous system was severed and the shock could not be attributed to nerve impulses. Later the blood-vessels were tied and the original pressure regained. Such observations rationally suggest that shock is brought about by absorption of toxic products from injured tissue, these being carried by the blood-stream throughout the body.

Shock is, therefore, a toxæmia and distinguishable from the local injury. Delayed shock, familiar in this war—injuries followed by shock only after time enough for the absorption of toxins, as at the base hospitals and not at the front—has, in this, a logical explanation. Accordingly, a tourniquet applied to a severely injured extremity close above the wound would prevent fatal shock, and if amputation has to be done, should not be removed until after the operation. It has been noted that cases in which a tourniquet was applied for hæm-



orrhage the patients escaped the shock which the terrible laceration seemed to assure. This questions the judgment of instructors who advise releasing the tourniquet every twenty minutes to restore the circulation, especially in view of the cases cited in which shock followed only the release of the constriction.

Broken bone ends in lacerated tissues must be kept still to obviate further damage and toxæmia. In the recent war the Thomas splint has probably prevented shock in many instances during transportation simply by its fixation. Gas gangrene from various bacilli which are proteolytic in action is associated with shock, the action being biochemical like that of autolysis in dying tissue and liberating toxic materials from protein decomposition. The fall of blood-pressure below 80 becomes itself injurious, due to the decrease in the oxygen supply to the tissues and the resulting acidosis; the lower the pressure the more rapid the injury, and the longer the pressure the greater the injury.

The best treatment for critical low pressure is the transfusion of blood. This supplies the volume of fluid and increases the number of oxygen carriers. Therefore it is particularly indicated when hæmorrhage is present as well. Other fluids are good also, even if transient in effect: normal salt solution, glucose solution, gum-salt solution (0.6 per cent gum acacia in 0.9 per cent sodium chloride). Transfusion, or infusion, must be done early to get ahead of the damage to the vital medullary centers; otherwise the pressure falls back again as soon as the inflow ceases. This fact emphasizes the importance of resuscitation measures in warfare as near the front as possible. In addition to the measures mentioned fluid by mouth or rectum is of great value. Robertson has determined that 1,500 cubic centimeters (33 per cent of a man's blood-volume) can be added to the circulating blood in this way in twenty-four hours and maintained. Heat also is of extreme importance. Blood counts have demonstrated that in severe shock there is a capillary stagnation, the red count in the capillaries commonly being as much as 2,500,000 more than in the veins. This fact and the loss of heat from sweating, exposure, wet clothes, and lying upon the stretcher in a patient who is producing less heat than normally, demand artificial heat. Heat, rest, and morphine have saved many lives. Another fact that must be remembered in the treatment of such cases is that patients in shock are very sensitive to anæsthesia which further depresses a dangerously low pressure and induces acidosis. Ether inexpertly administered might be fatal where  $N_2O$  and O (the oxygen 25 per cent) preceded by morphine, in amounts sufficient to maintain analgesia rather than anæsthesia, would be successful.

F. W. PINNEO.

**Fisher, W. H.: Myxoma.** *Ann. Surg.*, 1919, lxix, 596.

Myxomata are tumors composed of a tissue which resembles none found in the normal adult organism. It is made up of well-formed isolated

cells of a somewhat stellate appearance, giving off delicate processes. The individual cells are separated from each other by a matrix containing varying amounts of mucin which takes on a differential stain with thionin. In this matrix are large but thin-walled vessels. Many pathologists doubt the existence of a pure myxoma and contend that we should refer to myxomatous modification or degeneration of some form of connective-tissue neoplasm as a lipoma or chondroma with myxomatous change. While this must be admitted as regards most myxomata, there seem to be a few tumors which should be classed as entities. Ribert has described small pure myxomatous tumors of the endocardium. According to Ewing, pure myxomata cannot be differentiated into fibromata, lipomata, or other tumors. Dennis admits that myxomata do occur and believes that irritation leading to a chronic inflammation is an exciting cause in many cases as in the polypoid growths of the nose in patients suffering from chronic catarrh. Virchow reports myxoma of the labium which occurred and eventually produced many myxomatous metastases.

The author reports a myxoma of unusual size. The patient, a woman 50 years old, had noticed a small tumor on the right labium for five years. Its growth had been slow and it had never occasioned any discomfort except by its size. After removal it was found to weigh 7 pounds and measure 8 inches in diameter. Microscopic examinations of various portions showed it to be a typical primary myxoma. The author agrees with those who believe that a pure myxoma should be classed as an entity. The patient has had no recurrence at the end of more than a year and weighs 40 pounds more than she did before the operation.

GATEWOOD.

**Kelly, H. A.: The Early Recognition and Treatment of Cancer. The Duty and Opportunity of the General Practitioner.** *Therap. Gaz.*, 1919, xliii, 381.

The author states that we might briefly summarize the results of the past years of multiplied activities in the domain of malignant disease by saying that they have brought the subject of cancer prominently before the consciousness of the public and in this way have secured a more or less nation-wide co-operation in the discovery and treatment of many cancer cases in their early stages. Such early discovery and treatment of the condition saves thousands of lives yearly, and when ultimately the entire medical profession acts together in seeking out and securing prompt treatment for all early cases, the lives of many thousands more will be saved. The general practitioner is urged to assume that a condition is malignant until the contrary is proved.

The most obvious of all cancers, as well as the commonest, are those which begin in the skin of the face and are called basal-celled epitheliomata. The



treatment of these face cancers consists in either radium or surgery, and when instituted early is most successful. Radium is preferable as it resolves the tissue back to normal without loss of substance or disfigurement. In the more advanced stages nothing can be done except to relieve the victim with opiates.

In cases of cancer of the lip it is also of the utmost importance to suspect at once the tiniest lesion which does not heal immediately, which breaks out repeatedly, or which remains fissured. Here, too, radiation or an early operation will save much sorrow and regret. The great urgency for immediate action in this group lies in the fact that as soon as the lesion assumes any size, and sometimes when it is insignificant, it jumps down into the glands of the neck, where only a radical mutilating operation can reach it.

Mouth and tongue cancer must also be discovered early for successful treatment, for once the deeper tissues are involved the case is almost hopeless from every standpoint. Some tonsillar growths are very responsive to radium and some not at all. All, if malignant, are very poor surgical risks. The larynx, on the other hand, is a brilliant field for radium as sometimes even very advanced cases can be helped considerably.

Special emphasis is placed upon the urgency of treating seriously every little lump in the breast. Here surgery is the recourse, or rather surgery plus the microscope. The suspected tissue removed should not be thrown away but put at once into a 10 per cent solution of formalin and sent to a first-class pathologist for a report. The wide-mouth bottle with its 10 per cent formalin solution is just as essential a tool for the surgeon's kit as his knife or his needles and suture materials.

In cancer of the breast there is a surgical paradox to be proclaimed, namely, that while it is not in the best interests of the patient to treat any small growth or good operable risk with radium, nevertheless radium will sometimes do wonders in a very advanced inoperable case and is invaluable in recurrences and in preventing recurrences. If metastases are found in the lungs it is useless to radiate.

Hodgkin's disease is amenable to radium to an extraordinary degree. Lymphosarcoma, which from a surgical standpoint is utterly incurable, is easily dissipated by radium if treated early. Sarcoma of the testis, fatal through early metastases up into the abdomen, often gives brilliant results from radium and improvement even when far advanced.

The sum of the whole matter seems to be this: that greater zeal is needed on all sides in getting hold of cancer cases earlier and an equally greater zeal is imperative in getting them operated upon or treated with radium at an early date.

The paper is illustrated with fourteen cuts showing patients before treatment and after they have been cured by radium: two cases of epithelioma of

the nose; one case of extensive epithelioma of the eye; one case of extensive epithelioma of the nose and inner canthus of the eye; one case of cancer of the lower lip; one case of Hodgkin's disease (cured locally); and one case of lymphosarcoma of the neck which has remained well for over five years.

**Vries, W. M. de: The Formation of Metastases in Cancer** (Over Metastase-Vorming bij Kanker). *Nederl. Tijdschr. v. Geneesk.*, 1919, 1, 1068.

In a previous report the author stated that he found 518 cases of cancer in 3,700 autopsies. In the present report he takes up the question of metastases. In a total of 528 cancers of various parts of the body there were metastases into the liver in 156 and into the bones in 53. Metastasis into the lung tissue was not much more frequent than metastasis into the bones, i.e., in 66 cases only. Altogether there were 375 metastases in the 528 cases. It is possible that osseous metastases were more frequent as the whole skeleton was not examined.

The occurrence in several instances of multiple metastases suggests that they are formed by way of the blood-stream.

Metastases into the liver were most frequent in cases of cancer of the biliary passages (26 out of 36 cases). The same cases also gave a high percentage of lung and osseous metastases. Nineteen cases of prostatic and 17 cases of bladder cancer gave respectively 5 and 3 osseous metastases. Of 69 oesophageal cancers there were metastases into the liver in 18 and into the lung in 12.

The author believes that mechanical factors alone do not sufficiently explain the occurrence and variation in location of metastases of malignant disease. It is probable that cancer cells circulate very freely in the blood but die there quickly. In the organs in which metastases are rare, chemical factors may aid in their destruction, and this possibility suggests the treatment of cancer with extracts prepared from such organs. In the 528 cases of cancer examined metastases were found only 7 times in the stomach, 8 times in the kidney, and 7 times in the pancreas. In 12,730 autopsies, Kaufmann found 1,078 cancers, only 8 of which had metastases into the spleen. In these cases the primary lesion was abdominal or pelvic. However, experiments made so far with splenic extracts do not appear to have given any encouragement as the results were negative.

The comparison of various statistics shows that while primary cancer in certain countries varies considerably as regards the organ involved, the proportion and distribution of metastases are everywhere about the same for the same organ. This constancy in distribution of metastases, the exemption of the muscles, the extremely rare involvement of the brain, and the prevalence of metastases in the liver, bones, and suprarenals are matters for which no satisfactory explanation can be offered at present.

W. A. BRENNAN.



## BLOOD

**Harrop, G. A.:** The Oxygen Consumption of Human Erythrocytes. *Arch. Int. Med.*, 1919, xliii, 745.

The earlier work on the respiratory metabolism of the blood itself was in large part rendered valueless because of a lack of knowledge regarding the growth of micro-organisms, the effects observed being due merely to bacterial action. It has been shown by Warburg and by Morowitz and his pupils, however, that under certain circumstances each of the principal formed elements of the blood, leucocytes, erythrocytes, and platelets, has a measurable oxygen consumption.

Harrop explains there is now good evidence that the red cells in the circulating blood which appear reticulated when stained in fresh preparations with brilliant cresyl blue are young erythrocytes. The reasons for this belief are, in the first place, that increased bone-marrow activity, as indicated by a rise in the number of red cells and in the percentage of hæmoglobin, is accompanied by a parallel increase in the percentage of these cells in the blood; and, in the second place, that a large percentage of all of the red blood-cells in the bone-marrow without nuclei are reticulated.

The author has carefully studied the oxygen absorption in the blood of persons suffering from various types of anæmia and has compared it with the concentration of reticulated cells as well as with other abnormal findings in the blood in an effort to correlate the oxygen consumption, if any, which occurs in human anæmia with the other available findings.

The method used in estimating the reticulated cells was that of Robertson. This gives well-stained and well-distributed preparations. One thousand cells were counted in each case and the percentage determined therefrom.

For the determination of the blood-oxygen the blood-gas apparatus devised by Van Slyke was employed.

The following conclusions were drawn:

1. Normal mature human erythrocytes have no oxygen consumption measurable by present methods.
2. When measurably increased in the blood of individuals with anæmia, the oxygen consumption has no relation to the severity of the anæmia and no constant relation to histologic abnormalities in the erythrocytes other than increases in the number of reticulated cells.
3. Blood which contains abnormal numbers of reticulated erythrocytes has an oxygen consumption proportional to the percentage of reticulated cells present.
4. The data afford evidence that the two phenomena go hand in hand. Both are due to the presence of abnormal numbers of young cells, and both are probably rather accurate indicators of functional variations in the bone-marrow and the amount of blood regeneration.

G. E. BEILBY.

**Bond, C. J.:** The Physical State of the Blood-Serum in Relation to its Agglutinin and Antibody Content: The Effect of Friction and Pressure. *Brit. M. J.*, 1919, i, 729.

This article is interesting from many points of view but especially because the author states that the blood-serum can be changed in its character by purely physical processes. Such simple processes as friction and pressure cause a marked change in the biological activity of the serum.

Hæmagglutinating sera are often kept by allowing the sera to dry on a cover slip. The author noticed that on redissolving these dried films they varied in their hæmagglutinating property, and that when solution was facilitated by stirring, the agglutinating properties were less active than when solution was allowed to proceed without aid. To investigate this phenomenon further he placed serum in a mortar and ground it with the pestle. This caused it to throw down a sediment. The sediment was allowed to settle and the clear supernatant fluid pipetted off. The liquid was designated as Liquor I and the sediment as Sediment I.

On subjecting Liquor I to another grinding, still more sediment was formed. Upon again separating the liquid from the sediment either by gravity or centrifuge he labeled this second liquid and sediment Liquor II and Sediment II respectively. By a third process of grinding he was able to produce further liquid and sediment which were labeled Liquor III and Sediment III.

After producing and separating the sediments and liquors the author was interested in the effect of such a grinding process upon the agglutinating properties of the serum. The power of agglutination he represents as follows: +, ++, +++, etc. It was found that a serum with an agglutinating power of + could be raised to an agglutinating power +++ in the second and third liquors. The specificity of the serum is not changed by this process. Any serum which was negative in its agglutinating power on certain red cells remained negative after the grinding process.

Simply allowing a serum to stand will increase its agglutinating power, but not so markedly as the grinding process. A serum with a mere trace of agglutinating activity showed a + reaction in seven days. The sediment had no agglutinating activity when suspended in normal saline and mixed with red blood-cells.

Transudates contain no free hæmagglutinin nor do their liquors, but their sediments do. The reaction is the same for ascitic fluid. Exudates show the same reaction as the serum. The cerebrospinal fluid reacts as a transudate. The specificity of reaction in transudates, exudates, and other body fluids frequently disappears when subjected to the grinding process. The secretions such as saliva, mucus, and milk show agglutinative properties after grinding, but they are not specific. In the saliva and mucus the property resides in the sediment. In milk it is in the liquors.



The normal excretions such as urine show no agglutinin in the liquors but the sediments show a non-specific agglutination. Even the cells of the individual secreting the urine are agglutinated by the sediment. Albuminous urine shows agglutination in the liquors as well as the sediment.

The complement in guinea-pig serum remains in the liquor when subjected to the grinding process, as does the complement-deviating power of syphilitic sera. Grinding a negative serum does not convert it into a positive complement-deviating serum.

Bacterio-agglutinins act in the same way as hæmagglutinins. They are found in the liquors and their activity is increased by grinding. The increase in their agglutinative capacity is specific.

J. L. BUTSCH.

**Fleming, A., and Porteus, A. B.: Blood Transfusion by the Citrate Method.** *Lancet*, 1919, cxcvi, 973.

The author prefers the citrate method of blood transfusion on account of its technical advantage and believes it is the general preference of men who have had considerable experience with the different methods. The results of this method do not differ from those of others.

The direct method has many drawbacks. It is difficult, necessitates cutting down on the vessels, and inflicts more damage upon the donor than is justifiable. By this method, moreover, the amount of blood given, which is of great importance, cannot be estimated. The syringe method is troublesome as in order to get the proper co-ordination it requires two operators who are accustomed to operating together. The Kimpton tube also necessitates cutting down onto the vessels. The citrate method avoids all these objections, leaves all the vessels intact, and prevents clotting.

Fleming uses the Moss method of selecting his donors, but points out that this is unnecessary when what Lee said in regard to transfusion is kept in mind. Lee pointed out that only one thing matters as regards compatibility of bloods of donors and recipients, i. e., whether the serum of the recipient will agglutinate the corpuscles of the donor. This can be determined easily by mixing the donor's corpuscles and recipient's serum. Three drops of the donor's blood in 1 cubic centimeter of a 2 per cent sodium citrate solution gives about the proper proportion. The serum of the recipient is obtained by drawing about 5 cubic centimeters of blood from the vein with a small syringe and placing it in a test-tube. After the blood-clots and the serum have separated, the latter is pipetted off into another clean test-tube. The test is then made on a cover slip. Two drops of the recipient's serum are placed on the slip and then one drop of the suspension of the donor's corpuscles. The two are well mixed, allowed to stand an instant, and then examined under the microscope, the cover slips often being placed on a hollow ground slide. If the corpuscles are evenly scattered over the field and no clumping

of the cells is noticed, the donor is suitable. If, however, there is clumping and there are large clear spaces in the field, the donor's blood is unsuitable. In such cases another donor must be sought and tested out in the same way.

When many transfusions are made it is better to have the patients grouped. This may be done in a moment's notice if the serum of Groups II and III are at hand. The corpuscles of Group I are agglutinated by both sera. Those of Group II are agglutinated by Group III serum but not by Group II serum. Group III corpuscles are agglutinated by Group II serum but not by Group III serum. Group IV corpuscles are not agglutinated by either of the sera. Thus the blood of donors in Group IV may be given to any one, while that of donors in Group I can be given only to persons belonging to Group I, that of those belonging to Group II to persons belonging to Groups I and II, and that of donors of Group III to those belonging to Groups I and III. Eight per cent of people belong to Group I; 40 per cent to Group II; 10 per cent to Group III; and 42 per cent to Group IV. The most useful donors are those of Groups II and IV. The latter can give blood to all recipients and the former to 50 per cent of them.

The author uses the Robertson pressure bottle apparatus, which is described in detail. His work was limited mainly to cases of acute hæmorrhages and his results were excellent. He uses blood which he immunizes by placing into it small doses of vaccine and incubating for two hours. He tested the effect of the citrated blood on the coagulative power of the blood and found it did not modify it.

J. L. BUTSCH.

**Lindeman, E.: Blood Transfusions without a Chill by the Syringe-Cannula System: Two Hundred and Fourteen Consecutive Cases.** *J. Am. M. Ass.*, 1919, lxxii, 1661.

The author has devised a cannula which consists of three telescoping cannulae. The smallest has a sharp end while the outer two are dull pointed and successively shorter. These cannulae will fit any Luer syringe.

The complete apparatus consists of six 20-cubic centimeter Luer syringes, two tourniquets, two sets of cannulae, one for the donor and one for the recipient, and three basins containing sterile normal salt solutions.

In the operation one operator draws the blood and then passes the full syringe to a second operator who administers it. The second operator then passes the empty syringe to a nurse who rinses it in normal salt solution. The cannulae are left in place in the vessels of the donor and recipient throughout the procedure and the syringes are used repeatedly. By this method whole blood is administered by means of a minimum of apparatus in a minimum of time and without the use of anticoagulants.

Reactions in blood transfusions may be due to: (1) hæmolysis and agglutination, (2) toxic substances



developed in the blood during the time it remains outside of the body, (3) chemicals such as anticoagulants and sodium chloride, and (4) sensitization and anaphylaxis.

The author believes that with careful supervision of the tests for agglutinins reactions can be prevented by his method of transfusion. K. L. VEHE.

**Galindez, A.: The Importance of Hypercholesteræmia in Biliary Calculus** (Valor de la hipercolesterinemia en el suero sanguíneo en la litiasis biliar). *An d. Inst. mod. de clin. méd.*, Buenos Aires, 1919, iii, 225.

In a number of cases of operations for biliary calculus Galindez found that the value of cholesterol in the blood varied from a maximum of 3.4 per cent to a minimum of 0.6 per cent. The high figure was obtained in the case of a patient in an advanced state of pregnancy. He concludes therefore that as hypercholesteræmia is not constant it cannot be considered as a sign of biliary calculus. There is no constant relation between the cholesterol in the blood-serum and that in the bile.

Seventy-one examinations for cholesterol in the blood-serum were made also in disease conditions other than biliary lithiasis. Varying amounts of cholesterol were found. Thus cases of catarrhal icterus showed cholesterol in amounts varying from 0.7 to 2.1 per cent and pulmonary tuberculosis amounts varying from 1 to 3.6 per cent. There is, however, no constant hypercholesteræmia in the majority of the diseases which disturb the functioning of the liver.

Of 16 patients operated upon for chronic appendicitis, either alone or associated with pericolicitis, 10 showed hypercholesteræmia and 6 hypocholesteræmia.

Galindez' study has disillusioned him with regard to the diagnostic value of hypercholesteræmia in cases of biliary calculus. His findings contradict those of the French school. There are other factors besides lithiasis capable of affecting the quantity of cholesterol in the blood-serum. One of these is possibly insufficiency or bad functioning of the glands of internal secretion. W. A. BRENNAN.

**Larkin, J. H., Cornwall, L. H., and Levy, I. J.: The Technique for the Wassermann Reaction.** *J. Lab. & Clin. Med.*, 1919, iv, 571.

The following technique is employed by the authors in performing the Wassermann test. In its essential details it is the Wassermann-Citron technique with certain modifications based upon the results of the more recent research in this field.

The total volume of the reactions is 2.5 cubic centimeters, being one-half the amount of the original volume used by Wassermann and his co-workers. Each ingredient is diluted in accordance with preliminary titrations, so that for the test 0.5 cubic centimeter of each ingredient is added. The figures given apply to the original Wassermann

amounts, and for their application to the authors' work are divided by two.

Blood sera are sent to the laboratory on the afternoon of the day previous to that on which tests are performed. They are allowed to coagulate and stand at room temperature from one-half to two hours. The clots are then carefully separated from the sides of the tubes with a fine sterile wire and the tubes placed in the ice chest overnight. On the following morning the sera are poured off or pipetted from the clots, centrifugalization being resorted to only when the sera are not clear and free from cells. All sera are inactivated in a water-bath at 55 degrees centigrade for one-half hour.

The hæmolytic system consists of sheep cells and anti-sheep hæmolytic amboceptor derived from rabbits.

Corpuscles are obtained fresh from an abattoir on the day previous to that on which the tests are performed. The whole blood is collected in a sterile glass bottle, tightly stoppered and containing glass beads. It is defibrinated by gentle shaking for fifteen to thirty minutes. After defibrination it is filtered through twelve thicknesses of sterile gauze to remove any small clots of fibrin including cells in their meshes. The filtrate is placed in 15 cubic centimeter centrifuge tubes and centrifugalized four times at high speed. The first centrifugalization is for twenty-five to thirty minutes. The pure serum is then pipetted off and the cells well mixed with 0.9 per cent sterile saline. The second, third, and fourth centrifugalizations are for twenty-five, fifteen, and fifteen minutes respectively, the saline being pipetted off and fresh saline added each time. Samples of blood showing any hæmoglobin tinge in the supernatant saline after the third or fourth centrifugalization are discarded. The washed corpuscles are placed in the ice chest overnight, and on the following morning a 5 per cent suspension of the packed corpuscles is made up for titrations and tests.

Guinea-pig complement is obtained by bleeding to death from the carotid artery from three to five animals. Animals of average size weighing from 250 to 500 grams are selected when this is possible, and are not fed for at least twelve hours before the bleeding. Unnecessary excitement of the animals is avoided. The complement is obtained in the late afternoon preceding the day of the tests and it is allowed to coagulate at room temperature. The clot is separated with a small sterile wire, and the containers (15 cubic centimeter centrifuge tubes) are placed in the ice chest over night. On the following morning the serum is pipetted off and centrifugalized once at high speed until all cells are thrown down. It is then pipetted to another sterile container and placed in the ice chest until used. This usually yields a clear, yellowish serum. A slight hæmoglobin tinge is of no particular importance.

The anti-sheep hæmolytic amboceptor is placed in small, sealed, sterile ampules after inactivation



at 56 degrees centigrade for one-half hour. The ampules, each of which contains approximately 5 cubic centimeters, are kept in the ice chest near the ice.

G. E. BEILBY.

### BLOOD AND LYMPH VESSELS

**Lozano: The Present Status of Arterial Surgery** (Estado actual de la cirugía de las arterias). *Rev. españ. de cirug.*, 1919, i, 193.

Lozano reports the findings of a commission appointed to inquire into the recent developments in vascular surgery. The article includes a discussion on (1) arterial suture; (2) the treatment of aneurisms; (3) operations for assumed or confirmed arterial wounds; and (4) sympathectomy.

The technique of arterial suture has been greatly perfected, and owing to this progress healing can be obtained without coagulation or hæmorrhage.

The results which have been obtained so far in the experimental field, including work on lateral and circular sutures, anastomoses, and grafts, were obtained in cases in which the arteries were in a healthy condition. Such results have not been realized clinically.

The clinical indications for vascular suture have been reduced for the following reasons: (1) owing to the infection of the vessel-wall in cases of wounds; (2) owing to disease and degeneration of the arterial walls; (3) because in the majority of cases ligation gives the same results as suture without the danger of a subsequent hæmorrhage.

In the recent war suture was applied even to types of cases in which it appeared unsuitable. Ligation did not produce gangrene in more than 3 per cent of the cases although applied to arteries the condition of which was considered dangerous owing to failure of the establishment of collateral circulation.

In senile or atheromatous gangrene arterial suture is not applicable, owing to the diffusion of the lesions.

In circumscribed thrombosis suture is not applicable owing to (1) the difficulty of diagnosis and (2) the benefit obtained from expectant treatment.

The prevention of a solution of continuity in an artery by means of well-prepared grafts of limbotrophic tissue is considered an excellent method since it provides a satisfactory safeguard against postoperative hæmorrhage.

In the treatment of aneurisms the Matas arteriorrhaphy is the method of choice.

The Matas arteriorrhaphy is recommended for aneurisms and not recommended for war wounds and thrombosis for the following reasons: (1) in every aneurism a collateral circulation is established for a long time, even in the wall of the aneurismal sac itself; (2) in wounds and thromboses such collateral circulation is not fully established and the operation will interfere with it; (3) the Matas arteriorrhaphy is not strictly an arteriorrhaphy but a postoperative plastic operation which prevents hæmorrhage.

Surgical operation in vascular wounds ought to be immediate and an exploratory operation should be performed when the presence of such wounds is suspected.

The sympathectomy of Leriche opens up a new field in the surgical treatment of neuralgias, gangrene, and contractures if the facts as published are true.

W. A. BRENNAN.

**Oudard: The Surgical Treatment of Aneurismal Hæmatomata** (Traitement chirurgical des hématomas anévrismaux). *Arch. de méd. et pharm. nav.*, 1919, cvii, 346.

Oudard is an advocate of very early operation in cases of aneurismal hæmatoma due to war wounds. By the term "arterial hæmatoma" he means the effusion of blood following the complete rupture of an artery. If a sac is formed and its walls undergo a distinct fibrous or fibrocalcareous organization, this hæmatoma develops into a traumatic aneurism. Observations have shown that as a general rule a hæmatoma does not develop into an aneurism in less than twenty-five days.

The majority of surgeons are not in accord with the conclusion reached by the Interallied Surgical Conference with regard to early operation for such vascular injuries. Of 117 cases reported in the literature Oudard finds that only 30 were operated upon within twenty-five days and none within the first forty-five hours. The general impression is that establishment of collateral circulation should be awaited and that an immediate operation is very apt to be followed by gangrene. Oudard does not see that the ligation of an important limb vessel under such circumstances is more dangerous than ligation of the same vessel for an external hæmorrhage. By early operation in cases of hæmatoma the clots may be removed with facility, the compressed vessel freed, and the circulation actively restored.

Oudard's experience with early operations has been as follows: 9 early operations for aneurismal hæmatoma of the femoral artery with 2 cases resulting in gangrene; 5 operations upon the popliteal artery resulting in 2 cases of gangrene; 5 operations upon the axillary artery with 5 recoveries; 14 operations upon axillary and subclavian traumatic aneurisms with 14 recoveries; 28 operations upon traumatic aneurisms of the femoral artery resulting in 3 cases of gangrene; and 7 operations upon traumatic aneurisms of the popliteal artery with 6 recoveries and 1 case of gangrene.

By "gangrene" Oudard means total gangrene of the extremity of the limb, not a mere superficial gangrenous patch.

Delaying operation exposes the patient to infection, especially gas gangrene, severe secondary hæmorrhages, embolism, and disturbances due to increased venous pressure. Moreover, if the aneurism is permitted to develop it causes adhesions, nerve compression, etc. Many of these complications persist after a late operation.

In operating Oudard ligates both artery and vein.



In the many operations he has performed he has never had any real difficulty in finding the perforation, isolating it, and ligating the injured segment. These operations have been done within the first twenty-four hours and at the same time the thorough surgical treatment of the wound has obviated the danger of subsequent infection.

The simultaneous ligation of the vein in cases in which the artery alone is injured, re-establishes the equilibrium by creating an obstacle to the return circulation.

By early operation upon hæmatomata the traumatic aneurism may be excluded from the surgical pathology of war wounds.

Five case histories in which early operation failed are related with comments. W. A. BRENNAN.

### POISONS

**Covey, G. W., and Barron, M.: Pathology of (Mustard?) Gas Inhalation.** *Am. J. M. Sc.*, 1919, clvii, 808.

According to the field medical cards, 35 of the 37 cases included in this study of the effects of gas inhalation were due to mustard gas alone, 1 to mustard gas and phosgene, and 1 to phosgene alone. In 34 cases the action of the gas on the respiratory tract was the main cause of death.

The first stage of the effect of mustard gas inhalation consists in mild œdema, hæmorrhage, beginning ulceration, early fibrinous deposit, emphysema, and very early bronchopneumonia. The second stage is characterized by a marked fibrinopurulent membrane, more extensive ulceration, emphysema, advanced bronchopneumonia, and beginning necrosis. In the third stage there is ulceration with necrosis and abscess formation and massive bronchopneumonia. The attempts at healing are revealed by the organization and fibrosis. P. G. SKILLERN, JR.

**Fasiani, G. M.: On the Asserted Transformation of the Anaerobic Bacteria of Gas Gangrene** (Sulla pretesa trasformazione dei germi anaerobici delle gangrene gassose). *Sperimentale*, 1919, lxxii, 459.

The author refers to an article published in 1916 by Conradi and Bieling in which they stated that the different anaerobic bacteria described as agents of gas gangrene do not constitute a distinct species but are transformation stages of a type of bacterium capable of undergoing important morphological and biological changes.

The author undertook a series of investigations of the bacteria isolated from cases of gas gangrene with a view to verifying or disproving the above assertion. By experimenting with the various anaerobic bacteria obtained from the tissues, etc., in cases of gas gangrene he found that it was not possible to discover any modifications of the morphological or biological characters of the distinct species by repeated cultures in human muscle, by passage through a series of different substances, or by animal

inoculations. In the various experiments each species preserved its own fundamental characteristics unaltered. The very slight variations found in the forms of the colonies could not be considered modifications of any degree of importance. The author therefore concludes that the assertions of Conradi and Bieling have no foundation in fact.

The anaerobic bacteria which are found in the focus of gas gangrene may be divided into two main groups. The first comprises organisms endowed with a limited power of attacking protein but with a strong fermentative action upon the carbohydrates. In the second group are those endowed with a strong power to attack and split up proteins. The first group were shown by animal experimentation to be those which are mainly involved in pathogenic processes; the second group have little pathogenic action.

The variety of the bacteriological findings in the different muscles invaded by gas gangrene or in the same muscle group ought not to be regarded as due to transformation but solely to abnormality caused by more favorable environmental conditions.

W. A. BRENNAN.

### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Van Hoosen, B.: Emetin Hydrochloride in Malignancy.** *Woman's M. J.*, 1919, xxix, 101.

The author has administered emetin for malignant disease during the past year. Almost without exception the dose was 5 grains given intravenously or intramuscularly.

Thirty-five cases have been selected and their histories abstracted in this article as being those which best demonstrate the conclusions reached from a study of 100 cases treated in this way.

The author's summary follows:

Repeated intravenous injections of large doses (5 to 9 grains) of emetin in cases of malignant disease will result in: (1) the removal of surrounding infiltration; (2) fibrosis in the primary focus and in the metastases of adenocarcinoma and squamous-cell carcinoma; and (3) necrosis and subsequent absorption in epithelial or sarcomatous growths.

Ten grains of emetin administered at intervals in large or small divided doses subcutaneously or intravenously will control hæmorrhage from malignant disease.

Fifteen grains of emetin administered at intervals in large or small divided doses subcutaneously or intravenously will remove odorous discharges from malignant disease.

Twenty grains of emetin administered at intervals in large or small divided doses subcutaneously will mitigate or entirely relieve the pain of malignant disease.

Twenty grains of emetin administered in small or large divided doses subcutaneously or intravenously will produce a feeling of weakness, felt especially in the knees, and a tendency to tachycardia.



Small doses frequently repeated produce more serious disturbance than larger doses.

Large doses (5 to 9 grains) given intravenously may be followed by nausea, vomiting, or a chill, the reaction being either slight or severe but rarely lasting more than four hours and followed later (the next day) by a feeling of improvement.

To avoid severe reactions give emetin hydrochloride in 5-grain doses (put up in ampule form) and well diluted with 150 cubic centimeters of normal salt solution. Keep the finger on the pulse and interrupt the stream flowing into the vein at any change in the pulse or on the patient's complaint of dizziness or faintness. Fifteen to thirty minutes should be consumed in giving a single injection.

The primary focus may be treated with surgery, radium, the X-ray, or the cautery, according to the preference of the physician after the patient has had all or part of the emetin treatment.

If the primary focus is very large, remove as much of it as possible soon after the first dose of emetin.

The best time to treat primary malignant foci surgically is one week following a 9-grain dose, or three days following the second 5-grain dose, there being an interval of four or five days between the first and second 5-grain doses.

In cases of large malignant growths delay in removing the growth after the administration of one or two doses of emetin may endanger the patient's life by the absorption of devitalized protein.

The elimination of the toxæmia of malignancy is best accomplished through the intestinal tract.

After the second 5-grain dose of emetin, give the patient daily doses of fortified oil or Rochelle salts to control tachycardia.

One-thirtieth grain of strychnine sulphate given hypodermically during the intravenous administration of emetin may prevent a chill which may follow as a reaction.

Emetin treatment is not as satisfactory in recurrent carcinoma when thorough glandular removal was done in the original operative procedure as it is when the glands have not been disturbed.

In advanced cases of malignancy fistulæ often appear after the second or third dose of emetin.

The best results have been obtained by the administration of three 5-grain doses of emetin intravenously on the first, fifth, and tenth days respectively. Further emetin is not given for three weeks. At the end of that time two 5-grain doses may be given intramuscularly one week apart. The treatments are continued by giving two 5-grain doses intramuscularly one week apart each month until all evidence (clinical or microscopic) of malignant disease is removed.

E. C. ROBITSHEK.

**Winternitz, M. C., and Lambert, R. A.: *Œdema of the Lungs as a Cause of Death.* *J. Exp. Med.*, 1919, xxix, 537.**

Œdema of the lungs is a frequent terminal event in the course of many diseases, both acute and chronic, and in such cases is commonly interpreted as the

immediate cause of death. It constitutes, as is well known, a striking feature in poisoning by most of the noxious gases in modern warfare. It is, therefore, not surprising that in the clinical and pathologic reports of these fatal gas cases death should be regularly attributed to pulmonary œdema.

The question as to how œdema of the lungs may bring about death has long been discussed. The view generally accepted is that the fluid in the pulmonary alveoli interferes mechanically with gaseous interchange and that when this interference with respiration passes a certain critical point the patient dies of asphyxia; that is, he drowns in his own fluid. It is not the purpose of this paper to discuss the question as to how œdema of the lungs causes death, but rather the fundamental problem of whether the mere accumulation of fluid in the lungs is of itself a serious matter.

During the past two years an opportunity has been given the authors to study the effects of practically all the commonly used war gases under laboratory conditions. About 3,000 dogs and an equal number of other animals have been exposed to gas and then observed clinically and at autopsy. Particular attention has been given to the pulmonary œdema, which, as in man, is a fairly constant and, in many cases, a striking phenomenon of the gassed state. The observations, together with the results of some experiments upon what may be termed an artificial pulmonary œdema produced by filling the lungs of a normal dog with an isotonic salt solution, have led the authors not only to question the importance of pulmonary œdema per se as a cause of death, but to conclude that œdema of the lungs in general is merely an indicator of some underlying disorder and is rarely, if ever, directly responsible for the death of the patient or animal. These observations are summarized as follows:

Animals which die acutely from exposure to any of the gases of the respiratory irritant group, such as chlorine and phosgene, show at autopsy varying degrees of œdema of the lungs. Although this is regularly well marked in certain species (dogs for example), there are wide individual variations. In other species (rats and guinea-pigs for example), it may be a relatively inconspicuous feature, in spite of the fact that these animals are particularly susceptible to the gas. Likewise dogs which are killed before the action of the gas reaches its maximum effect show striking differences in the amount of fluid in the lungs and these differences do not harmonize with the variations in the symptoms manifested by the animals. Furthermore, many dogs which pass the critical forty-eight-hour period successfully and are classed as "recovered" often show, when killed, œdema of the lungs of greater degree than other dogs of the same experiment which succumbed.

The lungs of a normal animal may be filled with isotonic salt solution, thus producing an artificial œdema comparable to that found in the gassed state.

G. E. BEILBY.



**Rabinowitz, M. A.:** Acute Hæmatogenous Streptococcic Peritonitis. *Am. J. M. Sc.*, 1919, clvii, 797.

Acute hæmatogenous streptococcic peritonitis is the designation used by the writer for cases produced by a streptococcus infecting the peritoneum by way of the blood-stream without an apparent intermediary lesion of an abdominal viscus.

From the study of his eight cases the author concludes that an acute inflammation of the nasopharynx, particularly of the tonsils, served as the original focus from which virulent organisms reached the peritoneum through the blood-stream. Although these cases did not occur during an epidemic of streptococcic sore-throat, the throats and peritoneal fluids yielded an identical coccus. May not this organism (*Streptococcus hæmolyticus*), infect the human body just as in the epidemics, through milk and its products or by way of human carriers, handlers of infected dairy products, or those who have been in contact with cases of streptococcic angina?

As in only a few instances there was a history of pain in the throat or tonsillitis, it is possible that in these cases there had been no reaction on the part of the tonsils and the streptococcus gained easy access to the blood-stream. The absence of marked enlargement of the cervical nodes also was evidence of nature's failure to defend against systemic invasion. When the peritonitis followed a distinct anginal attack a period of well-being lasting three or four days frequently intervened before the sudden development of the symptoms of peritonitis.

The leucocyte count was very high, ranging between 25,000 and 64,000 and averaging 40,000. The abdomen was tender and moderately rigid all over. There was no marked distention, and careful examination only infrequently revealed evidences of fluid in the flanks. The patient rapidly passed into the terminal phase of peritonitis. Death occurred in from three to eight days of the onset of the peritonitic stage and was the result of cardiac and vasomotor collapse induced by a virulent toxæmia.

Blood cultures were taken during life in only four cases. A positive culture was obtained in only one. This was a pure culture of streptococci. The author believes cultures would be positive more often if they were taken at the very inception of the peritonitic process rather than on the second or fourth day thereafter as was done in his own cases.

At operation the peritoneal exudate varied from a thin, serofibrinous to a fibrinopurulent fluid. The peritoneal fluid yielded streptococcus hæmolyticus in pure culture in seven cases and in association with bacillus coli in one case.

Streptococcic peritonitis of the type described occurs in persons who have been previously healthy and almost exclusively in young females.

Following a discussion of the differential diagnosis the authors append abstracts of their case histories.

P. G. SKILLERN, JR.

**Pauchet, V.:** The Pathogenesis of Chronic Intestinal Stasis; Arbuthnot Lane's Disease (Pathogénie de la stase intestinale chronique. Maladie d'Arbuthnot Lane). *Rev. gén. de clin. et de thérap.*, 1919, xxxiii, 257.

The radiological examination and operative findings in cases of stasis may have both a mechanical and physiological explanation, the physiological cause probably preceding the mechanical. Stasis may result from kinks due to serofibrinous bands around the intestine and constricting loops which partially strangulate it. However, cases have been observed in which such constricting bands were not accompanied by stasis and also cases of stasis without constricting bands. In any particular instance it is difficult to say if the exact cause of the failure to function is mechanical or physiological.

In cases of functional disturbance without bands or kinks physical culture, massage, hygiene, and the use of purgatives, with perhaps organotherapy, ought to be sufficient to overcome the condition.

In cases of obstinate mechanical resistance in which medical treatment fails surgery should be resorted to and should consist of a partial or total colectomy. The results from this operation are most encouraging.

Whenever it is impossible to explain general auto-intoxication or abdominal phenomena the physician should be guarded in diagnosing the case as chronic appendicitis, salpingitis, or other infective condition until he has submitted the patient to a thorough radioscopic examination after bismuth meals and until such meals have entirely left the small intestine, the cæcum, the ascending and transverse colons, and the end of the large intestine, and the time taken by the contents to pass through each segment has been noted. Often a series of three or four radioscopic examinations will be necessary before a diagnosis of chronic intestinal stasis can be made.

W. A. BRENNAN.

## EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Merzbacher, L.:** New Experimental Findings Regarding the Degeneration and Regeneration of the Peripheral Nerves (Nuevas investigaciones, experimentales sobre la degeneración y regeneración de los nervios periféricos). *An. d. Inst. mod. de clin. med.*, Buenos Aires, 1918, iii, 293.

In a first series of experimental investigations carried out by Merzbacher the left sciatic nerve of a sheep was sectioned, the two ends sutured with catgut, and the sutured part wrapped in a sheath made from a piece of the jugular vein cut from the same animal. The experiments had the following results:

1. The degeneration in a sectioned and invaginated nerve covered with a vein sheath is identical with that in a nerve which is merely sectioned.

2. In an invaginated nerve the formation of neuromata is reduced to a minimum.



3. At the site of the interruption of the continuity of the nerve there is an intense struggle between the tissues of different origin. The result of this struggle is manifested by the formation of a new tissue which has three different components.

4. Neoformation tissue originating from the parts forming the invaginating vein inhibits the formation of neuromata.

In a second series of experiments the sectioned sciatic nerve was sutured and invaginated into a piece of the jugular vein which was filled with cerebral substance. In these experiments it was found:

1. That by invaginating a newly cut peripheral nerve into a segment of vein filled with cerebral substance inordinate and abundant proliferation of degenerated nerve fibers was prevented. Such a procedure therefore would seem to be indicated in order to obviate the formation of neuromata which are very troublesome during the cicatrization of sectioned nerves.

2. That the injected cerebral substance has a tendency to organize rapidly.

In the peripheral parts of the nerves interrupted in their anatomical and functional continuity and which, according to Waller's law, ought unfailingly to undergo complete degeneration, the author found numerous cylindraxiles and nerve sheaths which were intact and had escaped degeneration. He found also that the parts of the nerve nearest the brain matter which was injected into the invaginated vein developed a more energetic vitality and resistance than the parts further from it.

From these findings the author believes that it is logically deducible that the experiments point out a new method of increasing the vital resistance of a nerve isolated from its trophic center and restoring its resistance to degeneration.

W. A. BRENNAN.

**Smith, N. R.: Organ Extracts.** *J. Lab. & Clin. Med.*, 1919, iv, 517.

In the course of a series of experiments the author had occasion to attempt to determine the fate of Vaughan's poisonous protein cleavage product when administered enterally to cats. The presence of the poison in the blood-stream was definitely established by heart punctures following its introduction into the stomach by a tube. By withdrawals of heart blood from a dosed cat at intervals of ten to twelve minutes, followed by immediate transfer of such blood to guinea-pigs intravenously, a wave of toxicity could be noted that rose to a peak in about one hour and then gradually faded away. This observation was carefully checked by the injection of normal cat's blood. Following the matter one step farther, it seemed in order to determine whether any of the poison could be recovered from the tissues of such an experimental animal after it had been repeatedly dosed with the poison. Alcoholic extraction of the tissues followed by appropriate after-treatment of the extract was the method of procedure.

The tissues of seven species of animals were extracted with alcohol and found to yield a toxic extract, and it is believed that the tissues of all animals if extracted in the same way would produce a similar extract.

It was found that the extract of the tissues of the cat, which may be considered representative of all other tissues, contained solids in solution varying from .47 to 1.83 per cent of the original tissue.

The extracts were acid in reaction with the occasional exception of the extract of stomach and intestine. Adjustment of the reaction to neutrality did not alter the toxicity of the extracts.

There was some evidence that the toxicity of the extracts could be modified by previous treatment of the animals, especially by fatigue. Inanition was without effect.

Ether does not extract the toxic substance from tissue. Drying and fine division of rabbit muscle followed by alcoholic extraction gave an extract of negligible toxicity. In view of statements that are to follow, it is not believed that the toxic agent was destroyed by the drying, but rather that it was rendered insoluble in absolute alcohol.

Ignition to a white ash of the solids in extracts prepared by the use of alcohol shows an inorganic residue of approximately 0.4 per cent of the tissue. Subsequent solution of this ash to the volume of the extract from which it was obtained, followed by injection, shows it to be always as toxic as, and in some cases more toxic than, the extract from which it was derived.

It was found that water could be substituted for alcohol as the primary extracting medium, and that a more toxic extract resulted. Further investigation of this extract showed that the total solids had been increased by the use of water about 8 per cent, and the inorganic residue by 50 per cent.

The increase in toxicity of the water extracts, as measured in terms of reduction in the size of the dose required to kill, was approximately parallel to the increase of the inorganic material in the extracts. The author therefore believes that the inorganic constituents of the extracts, in whatever form they may be, are responsible for the toxicity.

That the inorganic substances were in some sort of combination is indicated by the failure of dialysis to make any separation of organic and inorganic materials. Whatever is in the extracts dialyzed freely.

By repeated freezing and thawing the toxic portion of the extracts could be concentrated to a very small volume in the lower part of the container in which the extracts were frozen. Five or six freezings gave the maximum effect. The increase in toxicity of the lower concentrated portion was roughly equivalent to the increase of solids in solution. The lack of toxicity in the uppermost portion of such a frozen extract was almost absolute.

Boiling does not affect the toxicity of muscle extracts. The toxic agent of muscle extracts is not removed by passage through a Berkefeld N filter.



Pyrophosphate salts are highly toxic for guinea-pigs upon intravenous injection. By comparative tests between pure phosphate salts and the inorganic salts derived from the extract by ignition it was shown that the toxicity of the ash solutions was caused by their content of pyrophosphates.

The toxicity of rabbit-muscle extract could not be modified by treatment with serum, either with or without incubation. This statement applies to both serum from a normal animal and serum from an animal that had been repeatedly injected with the extract and might therefore have been immunized against the extract.

Rabbit-muscle extract is toxic for rabbits, but in a higher proportion per kilogram of weight than for guinea-pigs.

The attempt to immunize rabbits by successive small injections of extract shows that the effects of the extract by this manner of injection become cumulative and are exaggerated beyond what would have been produced by a single injection of the total dosage up to the time when the animal succumbs. While lack of protein material in the extracts forbids the use of the term "sensitization" as ordinarily understood, the whole phenomenon is typical of such a state.

The general trend of the experimental part of this work indicates that the toxic agent in tissue extracts is a stable chemical entity or entities. The evidence is sufficient to warrant the statement that the inorganic materials of the extracts, especially the phosphorus, in whatever form they may be are the toxic agents of tissue extracts. G. E. BEILBY.

**Archibald, E.: The Experimental Production of Pancreatitis in Animals as the Result of the Resistance of the Common Duct Sphincter.**  
*Surg., Gynec. & Obst.*, 1919, xxviii, 529.

This paper deals with the problem of the causation of pancreatitis. It is generally believed that pancreatitis is due to gall-stones and that bile is forced into the pancreatic duct presumably by the impaction of gall-stones in the ampulla of Vater, but it is obvious that clinically the majority of cases do not admit of such an assumption as either no stones are present or if present are confined to the gall-bladder.

About six years ago the author began an investigation of the function of the sphincter at the outlet of the common duct which was described by Odie nearly forty years ago. In 1913 he demonstrated that it is possible to flood the pancreas with a solution passed into the gall-bladder through a cannula under a known hydrostatic pressure. The sphincter was found to be easily set into spasm by a rapid rise of pressure in the biliary system or the application of acid to the duodenal mucosa.

Resuming these experiments this year, but using ox and human bile which in some instances was infected and in others not, and sometimes included mucin and at other times was freed from its colloid constituents, the author was able to produce several

types of pancreatitis. Chief among these were the acute hæmorrhagic form involving the whole organ (hardening, moderate necrosis, and fat necrosis) and a mild type with very slight swelling of the pancreas, but with fat necrosis. Consequently we are now able to assert that many cases of pancreatitis in man must be due to a disordered action, probably a spasm, of the sphincter of the common duct which forces the bile into the pancreas.

It was observed that the underlying cause may frequently consist in hyperacidity in the first portion of the duodenum, with or without duodenal ulcer. Prolonged fasting, alcoholism, gastric and duodenal ulcers, and hyperchlorhydria, with alteration in the bile due to inflammation and blockage of the cystic duct therefore represent the probable clinical basis for the occurrence of pancreatitis.

**Lewis, M. R.: The Development of Cross-Striations in the Heart Muscle of the Chick Embryo.**  
*Bull. Johns Hopkins Hosp.*, 1919, xxx, 176.

The results obtained by different observers in regard to the development of the cross-striations in muscle-fibers differ so decidedly that the question arises whether any one of the views presents the entire story. Even though the discussion be confined to the development of this structure in one organ and to one form, as, for instance, the histogenesis of the myofibrils in the heart-muscle of the chick embryo, it is found that although the papers published are few in number they differ fundamentally.

In an effort to determine, if possible, the reason for these differences, a careful cytologic study of the development of the heart of the chick embryo was undertaken. For this purpose preparations of embryos varying in age from 10 myotomes to four days' incubation were made by a number of different methods. The astonishing outcome was that one particular procedure always resulted in the presence of complete cross-striations in the heart, whether in very young embryos (10 to 15 myotomes—about twenty-five to thirty hours) or in older ones (two to four days).

The author describes a number of experiments which show that the complete cross-striations can be demonstrated to be present in the earliest heart, i.e., about 10 myotomes or twenty-eight to thirty hours' incubation. In other words, cross-striations are already present at the age when certain observers demonstrate the appearance of granules, the formation of a net-work, the elongation of mitochondria, etc. from which they claim the cross-striated fibrils are derived later.

Thus it is seen that in the living cell cross-striations are present, but not fibrils. The cross-striations are very thin bands on the surface of the cell. They extend across the cell and are never in the narrow threads or fibrils. The fixation of the cell causes the formation of the surface layer into fibrils in which the cross-striations are drawn together into deeper bundles and thus become evident as sharply marked structures. In places where the pull on the surface



of the cell is such that the latter is not coagulated into fibrils, the cross-striations remain spread out as thin bands across the cell.

The complete cross-striations are present in the muscle of the heart of very young embryos (10 myotomes) much earlier than was supposed by other observers.

The physiologists have endeavored without success to formulate a theory based upon the myofibrils to account for the contraction of the muscle-cells. It is not surprising that such a theory has not proved satisfactory, at least in regard to the heart-muscle, since the structure upon which it was based is not a part of the living heart-muscle cell, but only of the dead cell. In other words, a cell containing the structure upon which it was attempted to build the theory is not capable of undergoing contraction.

G. E. BEILBY.

**Davis, N. C., Hall, C. C., and Whipple, G. H.: The Rapid Construction of Liver-Cell Protein on a Strict Carbohydrate Diet Contrasted with Fasting. The Mechanism of the Protein-Sparing Action of Carbohydrate.** *Arch. Int. Med.*, 1919, xxiii, 689.

The authors have been impressed with the great speed of repair of the normal liver following necrosis due to chloroform. Under such circumstances the formation of cell protoplasm proceeds with remarkable rapidity and exceeds any growth speed with which they are familiar. To illustrate: a healthy adult of 75 kilograms or 165 pounds body-weight will possess a liver weighing approximately 1,700 grams. A suitable chloroform anæsthesia during a fasting period will destroy one-half or more of this liver tissue, perhaps 800 grams. Under favorable circumstances complete repair can be effected in from seven to nine days—approximately 100 grams per day—although the most rapid regeneration would develop during the third and fourth days and might well exceed 150 grams.

Formation of new tissue at a rate of 100 or 150 grams per day means the construction of a mass of liver cells the size of the normal spleen or kidney every twenty-four hours. If this speed of growth should ever be attained by a malignant tumor it would give most astounding clinical histories—medullary cancers of the breast could grow to huge size in forty-eight hours, hypernephromata might attain their great size within a week or less, etc. Such speed of growth on the part of a neoplasm would most assuredly command the respect, if not the admiration, of the surgeon. Yet the normal liver is capable of this speed of growth in reparative processes and can repeat it at frequent intervals as experiments clearly show.

In regard to the effect of diet upon liver regeneration, it is stated that experiments completed in the authors' laboratory (unpublished) which deal with the regeneration of red blood-cells in anæmia would seem to indicate that under such experimental conditions carbohydrates may protect the body

protein from autolysis or katabolism. It is not impossible that carbohydrates may have both functions and may at times spare the proteins at the source, or again, act by conservation of end-products. The liver-regeneration experiments reported, however, are submitted as positive evidence that under the conditions of the experiment the exhibition of a carbohydrate enables the body to build considerable amounts of new cell protein. This is positive evidence that carbohydrates do act by conservation of protein split-products.

In another paper the authors have undertaken observations on fat feeding under the same conditions and it will be noted that there are rather remarkable differences between liver regeneration as influenced by carbohydrates and as influenced by fat. The fat diet does not favor liver regeneration any more than does starvation. Evidently fat does not favor the conservation of protein split-products under the conditions of the experiment.

The results of the experiments are summarized as follows:

The curve of urinary nitrogen excretion of a dog makes a sudden rise after chloroform injury. The actual amount of nitrogen eliminated following the injury is greater in a fasting than in a sugar-fed animal. Furthermore, the curve of excretion often remains well above the starvation metabolism base line if fasting is continued after chloroform anæsthesia. If sugar is given the curve immediately falls even below the pre-anæsthesia base line.

Liver repair is much more rapid and complete on a sugar or high carbohydrate diet than it is on starvation. In fact, an injury of one-half of each liver lobule may be completely repaired in nine days on a sugar diet, but only 50 per cent repaired under fasting conditions.

This is convincing evidence that the "protein-sparing action of carbohydrates" in this instance is a true conservation of protein split-products. This evidence can not be explained as protein sparing at the source or as simple inhibition of protein autolysis or katabolism.

It is suggested that the liver may be the place in which this union of carbohydrates and protein split-products may be made permanent, whether the resultant products are to be used in the liver or elsewhere in the body.

G. E. BEILBY.

**Davis, N. C., and Whipple, G. H.: Liver Regeneration Following Chloroform Injury as Influenced by Various Diets. The Mechanism of the Protein-Sparing Action of Fat.** *Arch. Int. Med.*, 1919, xxiii, 711.

From the experiments performed by the authors it is clear that the liver will regenerate at maximum speed following a unit of chloroform necrosis if the animal is fed a diet rich in carbohydrate, a bread and milk diet, or an ordinary mixed diet. The diets which rank next to this optimum group may be the parenchymatous organs (liver and kidney) and meat, perhaps brain, although the latter is usually dis-



tasteful to dogs. Liver regeneration is rapid on such rich protein diets and more data may show that the optimum regeneration may at times follow the administration of such foods.

Thyroid fed in large amounts is known to favor tissue katabolism, but this does not favor liver regeneration and may even inhibit it. Under such circumstances the liver cannot take advantage of the protein split-products and conserve them for use in the construction of liver-cells. It will be of considerable interest to observe the effect of large doses of thyroid combined with carbohydrate, of small doses of thyroid combined with carbohydrate, and of small doses of thyroid with and without carbohydrate.

Fat feeding supplies the most interesting observation brought out in this paper. Sufficient data are presented to show that liver injury will be regenerated on a pure fat diet just as rapidly as during complete fasting. In other words, the fat does not contribute in the least to the tissue building in the liver. Several deductions may be made from this evidence when it is recalled that pure sugar makes possible rapid and complete liver repair. Both fat and sugar are burned as fuel in the body and are recognized as "sparing protein" in one way or another. It has been suggested in another paper that sugar must "spare protein" by conservation of protein split-products which are constructed into liver protoplasm. It is of course possible and even probable that sugar also is capable of "sparing protein" by acting at the source of protein katabolism and preventing this autolysis or tissue break-down. Fat obviously acts as a "protein sparer" not by conservation of end-products and reconstruction of new liver tissue, but by some protecting action at the source of tissue katabolism.

The experiments reported mark out a clean-cut difference in the metabolism of fat and carbohydrate relating to protein construction and destruction. It may be that this reaction is limited to the peculiar conditions of these experiments, but the authors believe it may be applicable to general body metabolism. Surely the metabolism and cell repair of a large and important organ like the liver must play an important part in the body metabolism and give more than a hint concerning the reaction of other less rapidly functioning cells.

A general discussion of the experiments by the authors then follows. It is clear from the experimental data given that liver regeneration can be completed more rapidly on a diet rich in carbohydrate than on a very rich protein diet.

This applies to mixed diets like bread and skim milk as contrasted with lean meat diets. A decided difference is pointed out in liver regeneration as compared with serum protein regeneration. Kerr, Hurwitz, and Whipple found that serum proteins after considerable depletion were regenerated best on a rich protein diet, for example, meat. It is possible that the differences noted may be explained by inherent differences in the proteins which are be-

ing formed with unusual speed in the body. Certain foods may contain ingredients especially suited to construct a certain type of body protein but unsuited for another type of body protein. It is significant that an abundant mixed diet gives an optimum regeneration in such instances.

The difference in regenerative power between the parenchymatous organs and ordinary skeletal muscle noted may be only apparent. Pups were regenerated on liver and kidney, while adults were fed the muscle. There is a possible difference due to age. On the other hand, liver may be better than muscle because chemically more nearly the equivalent of the tissue which is regenerated. It has been shown also that the parenchymatous organs are more protective against chloroform injury than skeletal muscle when fed during the days preceding anaesthesia.

Thyroid may accelerate synthesis when given in small amounts with foods, as Janney suggested, but in the experiment here presented it was given in large quantities with no food, and the well-known action of increased metabolism with continued high nitrogen output and no increase in liver repair was observed.

The lack of repair on a fat diet is certainly quite striking when compared with the results with carbohydrates, proteins, and mixtures of the two. Fat under these experimental conditions has a very minor rôle in tissue building and apparently is limited to its dynamic function as a fuel in protein sparing.

The article is concluded with the following summary:

A diet of bread and skim milk gives the optimum repair following a unit chloroform liver necrosis. A similar reaction is to be expected with any mixed diet rich in carbohydrate. A liver necrosis involving the central one-half of every lobule (50 per cent of all liver parenchyma) will usually be repaired completely in from seven to nine days.

A diet of cooked skeletal muscle is not as favorable for rapid liver repair as the rich carbohydrate diet.

A diet of cooked liver or kidney is more favorable for rapid liver repair than a meat diet. This diet of parenchymatous organ tissue approximates the rich carbohydrate diet in efficiency of liver repair.

Beef extract given alone does not favor liver repair, which indicates that meat extractives are not particularly concerned in the reaction of liver repair.

Thyroid powder given in large doses with no food does not stimulate liver repair but does accelerate tissue katabolism and increased nitrogen elimination. This accelerated katabolism may even impede the liver repair which is to be expected in starvation.

Brain feeding is favorable to liver regeneration and repair. This diet approximates lean meat feeding in its favorable influence on liver repair. In this respect the brain diet stands in marked contrast to the fat diets.

Fat diets (vegetable oils, butter, lard, beef fat, etc.) do not aid in liver regeneration. The same repair is to be observed during fasting control periods.



The fat diet can spare the proteins of the animal at the source, but cannot act in conservation of protein material by taking an active part in reconstruction of new protein substance. G. E. BEILBY.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Watkins, W. W.:** Chest Roentgenology in the Selective Service Examinations. *Am. J. Roentgenol.*, 1919, vi, 283.

The author conducted the roentgen examinations in 1,140 cases of suspected cardiac and pulmonary disease for the Medical Advisory Board No. 2 of Phoenix, Arizona, under the Selective Service Act. The majority of the men were examined by the fluoroscopic method alone except when there was a discrepancy between the physical and fluoroscopic findings. In such cases a plate was made.

The conclusions drawn are as follows:

In the examination of 1,140 drafted men for chest disease, the physical examination never revealed tuberculosis which was not also readily shown by the roentgen ray.

In 24 per cent of the 1,140 men examined the physical examination failed to reveal a disqualifying chest disease which was demonstrated by the roentgen ray.

In revealing the mere presence of tuberculosis or other disqualifying chest disease, the roentgen ray would be sufficient in itself, but to determine the presence of activity, physical examination is necessary.

In any thorough physical examination of the heart or lungs, the roentgen ray should be employed unless the examiner is willing to accept the risk of 20 per cent error.

Just why the physical examination which failed to detect the presence of tuberculosis in 20 per cent of the cases should be the deciding factor regarding the activity or non-activity of a lesion, the author does not state. W. A. EVANS.

**Matson, R. C.:** The Value of Chest Fluoroscopy. *J. Am. M. Ass.*, 1919, lxxii, 1887.

This paper, which is based upon the examination of 72,985 second-draft men at Camp Lewis, is to some extent a criticism of an article by Diemer and McRae (*J. Am. M. Ass.*, 1919, lxxii, 172) which was based upon the examination of 425 rejected men from the same series. Matson's criticism is that figures for "rejects" alone are misleading, that figures for roentgenologic findings in "accepts" should also be stated, and that a comparison should be made with the physical findings in the cases of the 425 "rejects."

From complete tables attention is called to selected items as follows: Of 1,500 men whose fluoroscopic examination report was "tuberculosis suspicious," 1,372 were accepted by refer examiners for full military service and 128 were rejected with unmistakable tuberculosis. Of 2,349 reported by the fluoroscopists as "with abnormality," 2,249

were accepted by refer examiners for full service and 100 rejected for chronic tuberculosis. Of 12,393 reported negative by the fluoroscopists, 27 had physical findings sufficient to justify a diagnosis of chronic tuberculosis and were rejected.

Rejections were made only by refer examiners, men of ripe experience in the clinical diagnosis of tuberculosis. No men were rejected upon the roentgenologic findings alone. Re-examination by the refer examiner was made in all cases in which there was any evidence suggesting tuberculosis in the history or in the clinical or fluoroscopic examination.

Matson claims that a careful physical examination generally predicts the roentgenologic findings. Roentgenologic findings alone are of little value unless interpreted by physicians having a knowledge not only of roentgenology but also of tuberculosis from a clinical and pathological standpoint. As compared with a careful physical examination, the fluoroscopic examination, even when made by an expert, occupies a place of secondary importance so far as the diagnosis of tuberculosis in military service is concerned. Matson expressly states that his report is not to be interpreted as a reflection on the ability of Diemer and McRae, both expert roentgenologists, but he believes that they claim more for fluoroscopy than it should be expected to yield. He writes "in a spirit of constructive criticism with a sincere desire to be fair to both the physical and the fluoroscopic methods of examination. Both procedures have their place and must be held there. Neither can supplant the other." D. R. BOWEN.

**Bryant, F.:** The Cancer Problem. *Boston M. & S. J.*, 1919, clxxx, 576.

The author disclaims an attempt to present anything new on the subject and gives merely an up-to-date summary for the lay and scientific mind. A brief statement calling attention to the antiquity of the disease precedes a discussion regarding the generally accepted theories as to its causation and course. The importance of early diagnosis is emphasized if successful treatment is to be instituted. Stress is laid on the value of radiotherapy properly used as an adjunct to surgical and medical treatment. Applied before and after operation, it reduces the malignancy, seals up the lines of metastasis, and gives the greatest promise of ultimate recovery and permanent cure.

ADOLPH HARTUNG.

**Raulot-Lapointe, and Sorrel, E.:** The X-Ray Examination of the Large Intestine (Exploration radiologique du gros intestin). *Presse méd.*, Par., 1919, xxvii, 289.

In X-ray examinations of the intestines it has been the author's custom for several years to give four bismuth test meals at regular intervals of about four hours, so that when the stomach is about to empty its contents into the intestine a new digestion begins. In this way the bismuth is con-



tinuously injected into the small intestine, and consequently into the large intestine, and it is sufficient to examine the patient twenty-two hours after the first test meal in order to examine him simultaneously for the results of meals taken eighteen, fourteen, and ten hours before. The method therefore gives a general view of all the large intestine and reduces the number of necessary examinations.

This general view of the large intestine which permits the determination of its length, the form of the different segments, and the relations of the parts to the surrounding organs is in many cases sufficient, but there are other cases in which the roentgenoscopic examination must be supplemented by orthodiagrams or radiographs. Orthodiagrams have unquestionable advantages and facilitate the interpretation of certain images. It often happens that the bismuth masses give shadows that are obscure owing to the superposition of different intestinal elements; by palpation under the screen the shadows corresponding to the different elements can be separated, and by orthodiagrams an interpretation of the images can be arrived at which the screen examination cannot give. Radiography alone shows only one moment of the intestinal action and does not indicate at all or indicates very imperfectly the nature or quality of the intestinal movements. Moreover, it very frequently furnishes deformed images, even when the most recent methods are used.

W. A. BRENNAN.

#### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

**Allowing Improper Testimony to be Introduced Which Can Only Inflamm the Minds of the Jury.** *Peters vs. Howard, 206 Illinois App., p. 610.*

In the case of *Peters vs. Howard* the court reversed a judgment against Dr. Howard and discussed a number of points which should be of interest to the profession at large. The plaintiff brought suit to recover for damages for injuries said to have been caused by the negligence of the defendant who had been retained to attend and treat her at childbirth. She stated that during his treatment he carelessly and negligently placed against her body and limbs hot water bottles, and that by reason thereof large areas of skin had been burned and ulcers had formed on her body and limbs.

The defendant filed what is called a "general issue," which is a general denial of all the allegations in the plaintiff's declaration. He filed also two special pleas setting up special defenses which were that the hot water bottles in question were not the property of, nor in the possession of, nor under the control of, the defendant and that the supposed negligences by the plaintiff alleged were not committed by the defendant nor by anyone under his control nor in his employ. The demurrer to these

pleas was sustained, the court holding that the defendant could introduce testimony on these two grounds without the necessity of pleading them specially. The trial court admitted testimony that the attending physician had opened one of the blisters on plaintiff's limbs using a safety pin which he took from one of the bandages, the statement being: "Why, he unpinned her leg and took off the bandage and found a place he thought needed opening, and he took the safety pin and was in the act of opening the place with the safety pin, and she says, 'Hold on, you mustn't do that with no safety pin; he was not going to pick that sore with no safety pin on her.'" A motion to exclude this testimony was overruled.

The court in disposing of this question of error as urged by the appellant in this case states that the sole purpose of this evidence was to inflame the minds of the jury against a physician by showing that he was so careless in his professional work that he would use a brass pin just taken from the bandage about a wound to break the flesh of appellee. The admission of this evidence was erroneous and very prejudicial, it could not be remedied by instructions, and it was the foundation for a very improper, inflammatory, and prejudicial argument.

Another question was raised in this case because an instruction was given to the jury referring it to the declaration and stating in substance that if the jury believed the plaintiff had proven her case as charged in her declaration it should find the defendant guilty. The defendant's objection to this was that the declaration did not state a complete cause of action as it did not negative contributory negligence and therefore the jury was instructed incorrectly as to the law. The rule is well settled in Illinois that before a plaintiff can recover she must prove not only that the defendant was negligent and that such negligence was the proximate cause of the injury complained of, but also that she was free from negligence which would contribute to the injury; that is, that she carried out the doctor's instructions in regard to taking medicine and care of herself, etc. The court holds that malpractice cases are much the same as cases against a railroad company for injury to a passenger, and that in those classes of cases the plaintiff must show that she was in the exercise of due care and free from contributory negligence as a prerequisite to recovery. The judgment was reversed and the case remanded for a new trial.

J. A. CASTAGNINO.

**Liability of Physician and Manufacturers of Ether.** *Moehlenbrock vs. Parke, Davis & Co., et al. 169 Minnesota N. W. R., p. 541.*

The case of *Moehlenbrock vs. Parke, Davis et al.* in the 169th Northwestern Reporter 541, grew out of the following statement of facts. The plaintiff, a young man, went to one of the defendants for a tonsillectomy. One of the other defendants gave the anæsthetic using ether which was manufactured by the remaining defendant. The contention of the plain-



tiff was that the defendant physicians were negligent in administering the anæsthetic and that the defendant, Parke, Davis & Co. were negligent in manufacturing and placing on the market impure and dangerous ether.

From this statement of facts the peculiarly antagonistic character of the defenses to these allegations can be seen plainly. The defense of the doctors was that the administration of the ether was skillful and proper but that the ether was impure, while the defense of the defendant company was that the ether was pure but that it must have been negligently given. Because of this situation the trial court allowed the defendants considerable latitude in their examination of the witnesses. Complaint was made against the rulings which allowed the defendant physicians to express an opinion as to the cause of the death of the plaintiff's intestate, but the court held that this was not an error. The witness may express his opinion. The weight to be given that opinion rests with the jury.

The identification of the ether analyzed as that administered to the plaintiff's intestate and to another patient on the day following being sufficient, and there being sufficient evidence also to show that there was no change in the condition of the ether during that time, it was proper to allow the introduction of test-

imony showing the effects of this ether upon the patient during the operation on the following day.

People are sufficiently alike to justify the assumption that when a drug produces a marked result on one it will produce the same result when used on another, taking into consideration, of course, the age, physical condition, and strength of each. In fact, the entire practice of medicine and surgery is predicated upon this theory.

The defendant, Parke, Davis & Co., contended that the operating physicians were acting as the agents of the plaintiff's intestate and that therefore their negligence was also the negligence of the plaintiff's intestate. The court held, however, that this was not the law and that the negligence, if any, of the defendant physicians could not be held as the negligence of the plaintiff's intestate. The only joint enterprise was that of the defendant physicians, Moehlenbrock not being able to take any conscious part in the operation.

It was not necessary to prove that the defendant company had knowledge of the fact that the ether was impure. It was its duty to know before the commodity was placed upon the market that it was not impure and dangerous, and that impurities could not form in the container in which the ether was sold or shipped.

J. A. CASTAGNINO.



# GYNECOLOGY

## UTERUS

**Aza, V.: The Early Diagnosis of Cancer of the Uterus** (Diagnóstico precoz del cáncer uterino). *Arch. de ginecop.*, 1919, xxxii, 97.

Aza sums up his article as follows: Every hæmorrhage, no matter how small, which occurs at times other than the menstrual period, warrants the suspicion of cancer, regardless of the woman's age. Particularly significant are hæmorrhages produced by coitus, those which occur a year or more after the menopause, and the sanguineous discharge which the Spanish women call "water from washing meat." The majority of hard excrescences of the cervix are cancerous, as well as those which are friable and bleed readily; also true ulcers of the cervix in which there is definite loss of tissue. If in any of these circumstances the practitioner is doubtful, no time should be lost before making a pathologic examination of a small piece from the cervix or uterine scrapings. M. M. MATTHIES.

**Tuffier: The Enucleation of Fibroids and Pregnancy** (Énucléation des fibromes et grossesse). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 748.

Referring to Bar's recent communication on the subject of conservative cæsarean section, Tuffier reports a case of conservative uterine section for the removal of fibroids. When practicable this operation is always preferable to a mutilating hysterectomy.

Since 1900 Tuffier has performed 131 hysterectomies for fibromata and 135 enucleations with preservation of the uterus and ovaries. He considers enucleation always the method of choice. In 49 cases in which he began in this way, however, he was ultimately obliged to perform a hysterectomy.

Tuffier takes up the question of the removal of fibromata before, during, and after pregnancy. Before pregnancy in the cases of young women, enucleation should be preferred to removal of the ovaries or uterus. Three hundred of the author's 315 patients were between 35 and 50 years of age. In the cases of the remaining 15 he performed 3 hysterectomies and 12 myomectomies.

Subsequent pregnancies in several of these cases have shown that the uterine scar is not a source of trouble in a later pregnancy. Moreover, in the cæsarean operation for fibroma the uterine dimensions are less than in the obstetrical cæsarean and the scar has greater resistance.

The indications for operation for fibroma in the course of pregnancy are very rare. In Tuffier's 3 cases they were the same in all, i.e., the presence of a large, hard fibroma embedded in the lower pelvis and probably in the supravaginal part of the neck of the lower segment of the uterine corpus. In the case

of one woman who was four months pregnant 2 fibromata which together had the volume of a fetal head were removed after section of the uterus. The pregnancy continued and the patient was delivered of a living child after seven and a half months. In the other 2 cases of myomectomy with suture one patient aborted a week later. The pregnancy of the fourth continued but the final result is not known. Everything depends upon the position of the fibroma with regard to the uterine mucosa.

Tuffier concludes that when an operation is judged necessary for the removal of a fibroid, enucleation, when practicable, permits pregnancy and a normal labor.

In the course of pregnancy there are two courses to follow: (1) the pregnancy may be allowed to go on and the tumor removed later following a cæsarean operation; and (2) the fibroma may be removed at once. The latter course often causes abortion.

After labor, either natural or surgically induced, it is better to enucleate fibroids than to run the risk of another pregnancy complicated by new fibromata.

W. A. BRENNAN.

**Adeodato, I.: Ligamentary Hysteropexy in the Treatment of Uterine Retrodeviation** (Contribuição ao estudo da hysteropexia ligamentar no tratamento dos retrodevios do útero). *Brazil med.*, 1919, xxxiii, 89.

Adeodato believes that the shortening of the round ligaments, or ligamentary hysteropexy, is the most rational of all the methods employed for correcting retrodeviation of the uterus, and that the Alquié-Alexander-Adams technique by the inguinal route has never been surpassed from the standpoints of anatomy and physiology.

The same physiological advantages, however, can be obtained by the abdominal route when for the removal of adhesions or some other surgical reason the abdominal route is necessary. There are two methods of accomplishing this, i.e., the method originated in the United States by Gilliam and in France by Doléris and modifications of this operation.

As the original Gilliam technique offers the possibility of intestinal strangulation, the author prefers the modified technique which he describes. In one of his cases operated upon by the Gilliam technique a loop of intestine slipped down within the pocket formed in front of the uterus by the round ligament which was sutured to the rectus muscle. To prevent this, Adeodato now fastens the vertex of the loop of the round ligament to the side rather than to the median line in order to keep the fundus of the uterus away from the peritoneal incision and prevent the development of adhesions.



Certain cases of retroflexion require a complementary operation to correct the angle of flexion. This is applied to the isthmus in order that the fundus may not be brought too close to the sutured incision in the peritoneum.

As the surgical operation alone does not suffice to free the patient from all the effects of the retro-deviation, local and general treatment should be given both before and after operation.

W. A. BRENNAN.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Saint, C. F. M.: Pyosalpinx Containing a Round Worm.** *Edinburgh M. J.*, 1919, xxii, 387.

Saint reports the case of a 16-year-old girl who was admitted to the hospital with continuous pain in the lower abdomen accompanied by bladder pain and delay in voiding urine, vomiting, and a rise in temperature. Menstruation had been regular, somewhat excessive, and painful.

On examination it was found that the pulse-rate was 84, the temperature 100, and the general condition good. There was rigidity of the right rectus and slight hypogastric tenderness. The vaginal findings were a bulging of the right fornix and displacement of the cervix to the left.

Following a diagnosis of infected cyst of the broad ligament, a midline incision was made. The operative findings were as follows: a recent pelvic peritonitis, omental adhesions, normal left tube and ovary, and distension of the right broad ligament by a tense, egg-shaped swelling which almost closed the true pelvis and pushed the uterus over toward the left. The broad ligament was incised along the upper border and the cyst shelled out of its bed. When ruptured the cyst was found to contain foul pus and a dead round worm  $3\frac{1}{2}$  inches long. Vaginal drainage was established and recovery was uneventful.

The author believes that the worm gained entrance through the vagina and os uteri. W. F. HEWITT.

**Magery, R.: Fallopian Tube Incarcerated in a Femoral Hernia.** *Med. Press*, 1919, cvii, 457.

The author reports the case of a multiparous woman, 38 years old, who had had a small lump in the groin for several years. Suddenly severe pain developed in the region of the lump. The tumor did not disappear when the patient reclined. When examined she had vomited twice and the pain had continued for eight hours. The general condition was good. In the right saphenous opening a rounded, tense tumor the size of a pigeon egg, tender to pressure and without impulse on coughing, was palpated. At operation a right femoral hernia was found. The sac contained blood-stained fluid and 5 centimeters of the distal end of the right tube. The tube was red and shiny and could be dropped back into the abdomen only after nicking Gimbernat's ligament. The ring was closed by stitching the pectineus muscle to Gimbernat's and Poupart's ligaments. The patient recovered. W. F. HEWITT.

**Bizat, A. R.: Ovarian Salvation vs. Ovarian Destruction.** *Am. J. Surg.*, 1919, xxxiii, 134.

If the patient has but one ovary and is without issue, endeavor to conserve it until the possibility of issue is gone; if necessary, it may be removed at a later date. The same statement applies to all cases in which there is doubt, excepting in the presence of definite malignancy.

It is a hazardous risk to leave an ovary on one side and a tube on the other.

It is not always safe to remove both tubes, leave a part of one ovary, and inform the patient that she will be barren.

Under no circumstances should the ovaries be removed for mere prophylaxis.

EDWARD L. CORNELL.

#### EXTERNAL GENITALIA

**Sweetser, H. B.: Vaginal Hernia.** *Ann. Surg.*, 1919, lxix, 609.

The patient whose case is reported was a single woman, 21 years of age, who was employed as a waitress. Her only complaint was the presence of a swelling which protruded from the posterior wall of the vagina at the perineal juncture when she stood or strained, but which almost disappeared when she was lying down and relaxed. Although it was painful, she had suffered no sudden severe attacks of pain.

The patient had never been pregnant. The vaginal orifice was very much relaxed, and upon straining and especially when she was in the upright position, the posterior wall projected through it in the midline to the size of a small orange, exactly simulating a large rectocele. The perineum, however, was intact.

Under anæsthesia, examination of the rectum revealed that it was not prolapsed at all into the apparent rectocele and took no part in the formation of the swelling.

A transverse incision was made at the mucocutaneous juncture of the perineum, and a vertical median incision up the posterior wall of the vagina, the flaps being dissected back. The tumor wall, which was later found to be the peritoneum, was very thin and easily separated from the anterior rectal wall. After the dissection had been carried up to the level of the recto-uterine pouch behind the cervix, the sac was opened and a large amount of yellowish fluid drained off, estimated at about a pint. As it was then not possible to make out the conditions present through the incision already made, the lower field was abandoned at this point and the abdomen opened above the pubes.

The omentum was then found firmly attached to the uterus and broad ligaments. The tubes were absent. The ovaries were small and full of small cysts. When the omentum was detached, the coils of bowel separated, and the uterus drawn forward, an opening was discovered in the centre of the Douglas pouch, about 1 inch in diameter, through which the finger could be passed into the cyst below. There



was no cyst wall above. The opening was closed with sutures which included the sacro-uterine ligaments and the abdomen closed without a drain. Returning to the vagina, the sac was twisted into a cord, tied and cut off, and the levator muscles sutured over the stump. The redundant vaginal wall was then excised and the edges sutured.

The patient left the hospital three weeks later when the parts were firmly healed.

In seeking an explanation of the condition found, i.e., a hernial sac containing fluid but no intestine or other viscera, the author has come to the conclusion that at the operation for removal of the tubes the fibrous floor of the cul-de-sac was injured and at the same time a pelvic peritonitis had developed. This had formed adhesions between the coils of the bowel and the omentum, creating an encysted collection of fluid at the bottom of the cul-de-sac the pressure of which caused a pouching downward of the peritoneum. A year later, when the patient suffered a severe attack of typhoid, the tissues relaxed and allowed a protrusion of the hernial sac into which the bowel could not enter because of the adhesions which held them up.

EDWARD L. CORNELL.

### MISCELLANEOUS

**Giacobini, G.: Thyroid Sterility** (Esterilidad tiroidea). *Semana med.*, 1919, xxvi, 272.

Complete sterility may result from thyroid insufficiency. Two cases are reported. The first was that of a woman who had been married ten years. For the past few years she had suffered from menstrual disturbances—metrorrhagia which was repeated two or three times each month and headaches. Her condition was diagnosed as due to thyroid insufficiency. By means of organotherapy the menstrual function was regulated and after two months of treatment she became pregnant and was delivered at term without incident.

The second case was that of a woman who had been married eight years. Menstruation was abundant and hæmorrhagic. This patient also after treatment with thyroid extract became pregnant and was delivered at term.

The author states that he could cite a large number of similar instances of sterility traceable to thyroid deficiency, and that this should be classified as a special type of sterility.

W. A. BRENNAN.

**Barragan, D. M.: Pathologic Relations Between the Genital and Urinary Tracts in Woman** (Relaciones patológicas entre el aparato genital y el urinario en la mujer). *Rev. de med. y cirug. práct.*, 1919, cxxii, 257.

Barragan's long article on the interrelations of the female genital and urinary tracts has been continued for several months. Any pathologic or even mechanical condition in the one is reflected in the other. In the concluding installment of the article the author points to the care which should be taken to avoid injury to the bladder in abdominal opera-

tions and especially when exerting traction on a tumor or treating an adherent growth. Dense adhesions may cause the bladder to become twisted and adherent to a tumor and it may be possible to identify it only by filling it with fluid.

Barragan has frequently been consulted by patients giving a history of bladder complications after hysterectomy. In the case of one patient who had had a hysterectomy the symptoms for which she was operated upon recurred and there was a persistent vesicovaginal fistula. Subsequently a calculus which had developed about some strands of silk was removed by lithotripsy. A similar operation was necessary some months later, due to the development of other calculi in the site where an injury inflicted on the bladder during the hysterectomy had been sutured.

A second similar case was that of a woman who had had an enormous ovarian cyst removed three years previously.

Barragan discusses the pyelonephritis of pregnancy and eclampsia. When in the latter there is a living foetus two factors are involved: (1) the toxins from the foetal metabolism, and (2) the defence of the maternal organism which produces substances to neutralize the foetal metabolic toxins. When there is equilibrium between the two there is a harmonious homogeneous symbiosis, but when there is lack of equilibrium very marked disturbances often result, even in the early months of pregnancy—a pregnancy toxæmia manifested by irrepressible vomiting, etc. The various reactions of pregnancy follow, their character depending upon the amount of inequality between the two factors mentioned. These conditions clearly result from a disturbance in the normal relations between the genital and eliminating systems.

Physicians should be on guard to detect symptoms indicating such abnormal conditions as early as possible so that they may be able to strengthen the maternal defences. The use of Ambard's constant is one of the best guides. The study of two perfectly normal pregnancies at three and five months respectively showed this constant to be 0.062 and 0.074. As soon as a pregnancy toxæmia is diagnosed, prophylactic methods should be instituted.

W. A. BRENNAN.

**Keen, W. W.: A Case in Which for over Thirty-Five Years a Woman Defecated and Urinated, and for Eleven Years Menstruated, by the Rectum.** *Ann. Surg.*, 1919, lxix, 606.

The case reported is worthy of record as an evidence of the possibilities of surgery and especially of the fact that the rectum may be utilized as a common cloaca for the urine and the menstrual flow as well as for the fæces for an indefinite period.

The case was one of extensive and incurable vesicovaginal and rectovaginal fistulæ caused by sloughing as a complication of typhoid fever. Ultimately the author entirely closed the vaginal outlet.



At the time this case was first reported in 1876 only one similar case had ever been published. This was by Brown in 1864. In 1917 Peterson collected 38 similar cases and reported in addition 2 of his own. While Maisonneuve had performed the same operation in 1851 for the first time, he did not report it until 1889. Rose operated upon three cases in 1872, 1883, and 1886, one of which was reported in 1878 and the other two in 1903.

The author's case is the only one in which the condition was caused by typhoid fever. In 33 others in which the cause was stated 25 resulted from childbirth and 4 from operations for cancer. Closure of the vagina was successful except at the internal end of the remnant of the urethra. After several minor but unsuccessful operations the author excised this small remnant with entirely successful results. Fistulae in the cicatrix broke out at intervals of 2, 19, and 8 years but were easily remedied. Thirteen years after the vaginal closure there was escape of urine. Digital examination by the rectum showed contraction of the rectovaginal fistula and the presence of a calculus in the vagina. The calculus was crushed with a curved hemostatic forceps introduced through the rectum. At the time of her death at the age of 73 the patient had remained well, with the exceptions noted, for 35 years, and for 5 months after the closure of the vaginal outlet.

**Norris, C. C.: The Menopause. An Analysis of Two Hundred Cases.** *Am. J. Obst.*, 1919, lxxix, 767.

Menstruation being dependent upon an ovarian secretion, it is fair to assume that the menopause is due to a change in the ovary. This theory is borne

out by clinical facts, histologic studies, and animal experimentation.

The generally accepted statement that the menopause is established at 42 to 45 is incorrect. Forty-six to 49 is nearer the actual age in the eastern United States.

Among normal women the age at which the menopause appears varies within wide limits.

The following conditions prolong the menstrual functions: child-bearing, marital relations, good nutrition and hygiene, city life, and education, while converse conditions tend to an earlier menopause.

Climate and race undoubtedly play a definite part in the age at which the menopause occurs but are probably of secondary importance in the United States.

Hereditary influence is in many cases a potent factor; in some families the menopause occurs early, in others late.

In the majority of cases, the chief feature of the menopause is not the cessation or diminution of bleeding but the neuroses. These frequently antedate any change in the menstruation and may continue for six or eighteen months after the final cessation of bleeding. The actual bleeding, however, is the barometer of health.

Normally the menopause is established without an increased loss of blood. When menorrhagia occurs an examination is indicated. Metrorrhagia should always be viewed with suspicion.

In about 90 per cent of absolutely healthy women the menopause occurs normally, but among average women fully 30 per cent present symptoms which call for a careful physical and gynecological examination.

EDWARD L. CORNELL.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Parmenter, F. J.: Renal Affections Associated with Pregnancy.** *N. York M. J.*, 1919, cix, 1080.

For practical clinical purposes the author never considers the kidney to be the site of a primary infection.

In this article kidney infections are discussed according to their etiology as follows:

1. Acute or chronic septic processes elsewhere in the body, including focal infections—infections in the teeth, tonsils, and sinuses, intestinal bacteræmia, cholecystitis, appendicitis, pelvic inflammation, and leg ulcers.

2. Bacteria, bacterial toxins, and other products of inflammation which reach the kidney either through the blood-stream, the lymphatics, especially those along the ureter, or the ureteral lumen.

Attention is called to the fact that bacterial injury to the renal parenchyma may be prevented by the bactericidal powers of the cells of the convoluted tubules, the transitory nature of the infection, and the low virulence of the bacteria. Factors which lower the renal resistance in the presence of infection are trauma, previous damage from infection, concomitant disease such as calculus, and marked ureteral obstruction, when the kidney suffers not only because of mechanical blocking but also from the culture medium afforded by retained urine.

Parmenter divides all cases of kidney infection into two types: (1) bacteriuria and (2) pyelonephritis.

Bacteriuria is recognized clinically by the presence of bacteria in the ureteral urine in the absence of any abnormal substance such as pus. Symptoms may be absent entirely or, if present, entirely urinary.

Pyelonephritis, either acute or chronic, is characterized by general, local, or urinary symptoms. The general symptoms are the same as those of any infection—chills, prostration, a rise in the pulse-rate and temperature, and leucocytosis. The local symptoms are such as are found in any abdominal infection. The urinary symptoms are referred to the bladder and consist of frequency and urgency of urination, tenesmus, and the passage of small amounts of turbid urine. Symptoms of renal colic are infrequent. The general and local symptoms depend upon the severity of the infection and the lack of drainage; the urinary symptoms point to the establishment of at least partial drainage.

The diagnosis of pyelonephritis is made from the history and physical examination, with a careful search for foci and detailed urological tests. The latter include chemical, bacterial, and microscopic tests on the separate urines, an estimation of the

kidney function by a dye test, and a pyelographic study of the outline of the renal pelvis.

The cocci type of infection is more severe and will more often demand nephrectomy.

The less radical measures are:

1. Removal of the source of infection when possible.

2. Removal of any obstruction in order to limit the spread and virulence of the infection. The knee-chest posture for the pregnant woman is helpful and the ureteral catheter is often indicated. Stricture of the urethra is rare in the female but contraction of the meatus is found and may be relieved by dilatation.

3. The employment of every means to increase the patient's resistance.

4. Removal of all chronic foci early in pregnancy, especially if urinary symptoms are present.

Labor should be conducted with the least possible instrumentation so as to prevent an ascending lymphatic infection. Catheterization should be avoided unless absolutely necessary, but if it is needed, 1 oz. of saturated boric solution should be left in the bladder for its antiseptic effect. W. F. HEWITT.

**Welz, W. E.: Pregnancy in a Case of Improved Sporadic Cretinism.** *Am. J. Obst.*, 1919, lxxix, 655.

The patient, aged 36, began to get fleshy at 10 years of age. At 23, one year after marriage, she had a severe nervous breakdown, being in bed three months with marked delusions and illusions. Since then she had enjoyed good health. Her height was 63 inches, temperature 98.8, pulse 78, weight 189 pounds. Her weight had increased gradually since her twelfth year of age. She had a hearty appetite, normal urination, and severe constipation. The skin was dry, coarse in texture, and yellowish-gray in color; the face puffy, especially about the eyelids. The hair was coarse and gray, and its color had been the same for sixteen years. There was little hair under the arms or on the genitals but a few coarse hairs on the upper and lower lips. The root of the nose was slightly depressed, the lips very thick, and the teeth poor. The head was large, the fontanelles closed normally, and the head thrown forward when the patient was standing. The thyroid gland could not be palpated. The abdomen was globular, with a marked panniculus adiposus; above the pubes was a large, pendulous pad of fat. The legs and arms were also well padded with fat. The breasts were large and pendulous, being mostly fat with little glandular tissue. The legs and arms were noticeably short. The upper arm was 10 inches long, and the lower arm, 10 inches. The hands, which were 6 inches long, were stubby and broad.



The patient was delivered at term by cesarean section because of a generally contracted pelvis. Recovery was complete. EDWARD L. CORNELL.

**Potocki: Retroperitoneal Hæmatoma in the Course of Pregnancy** (Hématome rétro-péritoneal au cours de la gestation). *Ann. de gynéc. et d'obst.*, 1918, xliii, 346.

Potocki states that as gestation often aggravates previously existing disease it may in this way favor the production of hæmorrhages in regions apart from the genital zone, although such cases are rare.

The case reported was that of a woman aged 35 years who was in her third month of pregnancy. While apparently in a state of good health, she was seized suddenly with alarming symptoms suggesting a severe internal hæmorrhage. On admission to the hospital it was thought that the condition was a ruptured ectopic pregnancy. A more detailed examination, however, disclosed the presence of a tumor in the left side of the abdomen extending from the upper part of the iliac fossa to the costal border. Owing to the patient's weakness it was at first thought best to defer surgical treatment, but as during the night she was again seized with the same symptoms, an operation was performed immediately.

The genital organs were negative. On pushing aside the intestines, however, an enormous violet-red mass was found in the retroperitoneal region. Before the operation could be carried further the patient died. Autopsy showed that the mass was an enormous hæmatoma under the posterior parietal peritoneum which had pushed up the pancreas and suprarenal capsule and had almost completely enveloped the kidney.

The author is of opinion that the pregnancy was in no way etiologically connected with the hæmorrhage, but that its co-existence may have favored it.

While the origin of the hæmorrhage was not explained by the autopsy findings, the author concludes that it originated in the kidney but was not due to a tuberculous lesion. The vessel most probably involved was the renal artery.

Diagnostically hæmatomata of the type described may be differentiated from those of an ectopic pregnancy by their situation. Surgical intervention is indicated in severe cases to assure hæmostasis and evacuation of the blood. W. A. BRENNAN.

**Caturani, M.: To What Extent Must We Depend upon the Microscopic Examination to Support the Clinical Diagnosis of Ectopic Pregnancy?** *Am. J. Obst.*, 1919, lxxix, 716.

Of 100 specimens of tubes or adnexæ removed after the clinical diagnosis of ectopic pregnancy, only 15 failed to produce positive microscopic evidence.

The rupture of the tubes, which is ragged and typical of the erosion of the chorionic cells, is almost pathognomonic of ectopic pregnancy. In forty-two cases of rupture, only one showed negative micro-

scopic findings. In cases of complete tubal abortion and hæmatosalpinx of long standing evidence of pregnancy is very difficult to find. Considering the difficulty of obtaining microscopic evidence, the percentage of negative cases in the series submitted to microscopic examination is small.

The information derived from cases of hæmatosalpinx or hæmatocele considered to be due to other causes than ectopic pregnancy is also at times incomplete. The detailed and convincing observations of Freund, Schamberger, and Bazy are sufficient to demand at least the revision of the old teaching that hæmatosalpinx and hæmatocele are nothing but accidents of ectopic pregnancy (Veit). To avoid exaggeration it is best to accept the contention of Zweifel that it has been histologically proved that ectopic pregnancy is the cause of hæmatocele.

Unless a different etiological factor can be demonstrated in doubtful cases, the importance of the clinical data must not be underrated.

EDWARD L. CORNELL.

**Farrer, L. K. P.: An Analysis of 309 Cases of Ectopic Gestation in the Woman's Hospital in the State of New York.** *Am. J. Obst.*, 1919, lxxix, 733.

In the ten years from Jan. 1, 1909, to Jan. 1, 1919, there were recorded in the Woman's Hospital 320 cases of ectopic gestation. The clinical history and the operative findings bore out this diagnosis, but as in eleven cases the pathologists did not find foetal elements in the tissues, the author has not included these cases in his statistical study, believing with Cragin and Bovée that ovarian and tubal hæmorrhage of non-gestational origin cannot be differentiated from the hæmorrhage caused by an ectopic gestation except by microscopic examination of the tissues.

During the same decade there were 19,674 patients in the gynecological service of the Woman's Hospital of which 309 were cases of ectopic gestation, an incidence of 1.5 per cent.

Infection or mechanical alteration due to adhesions of the fallopian tubes predisposes to ectopic gestation.

The onset of symptoms of an acute attack occurs equally as often at the time of an expected period or just after a normal period as it does when a period is overdue.

Pain with or without bleeding is present in every case of ectopic gestation unless it is unruptured.

Tearing, lancinating pain is not as common in ectopic gestation as pain of a cramp-like or bearing-down character.

Unusual one-sided pelvic pain when associated with evidences of peritoneal irritation and fainting warrants the diagnosis of ectopic gestation.

The treatment should be operative in every case as soon as suitable hospital arrangements can be made, examination being deferred until the patient has entered the hospital if she is in a serious condition.



The end-results justify leaving the opposite tube in the abdomen at the time of operation unless it is positively diseased.

EDWARD L. CORNELL.

**Lowe, C. V.: Abdominal Pregnancy.** *Brit. M. J.*, 1919, i, 767.

On September 18, 1918, a woman, aged 35, was admitted to the maternity ward of Sheffield Union Hospital. She stated that she had had four normal labors previously, that her last period had occurred in November, and that she had had "labor pains" for a week before admission.

The patient looked ill and anxious, and complained of a foul taste in her mouth. The tongue was dry and coated. The temperature was 99.6 degrees. The abdomen, which was enlarged up to the ensiform cartilage, felt very tense and was extremely tender; foetal parts were very difficult to make out. There was a soft elastic swelling above the pubes. The uterine souffle was heard on the left side, but the foetal heart sounds were not audible. The presentation was vertex, low down in the pelvis, and movable; the os uteri was represented by a small dimple immediately beneath the symphysis pubis. The urine was acid, specific gravity 1.022, and contained albumin.

A diagnosis of abdominal pregnancy was made and the abdomen opened. The uterus was found to be enlarged up to the size of a five months' pregnancy; the fallopian tubes were intact. A full-time dead foetus was found to be lying in a bag of membranes which was attached to the left side of the broad ligament. The foetus was extracted, the broad ligament clamped, and the mass removed. The placenta was attached partly to the pelvic colon and partly to the broad ligament, and in separating it a considerable amount of hæmorrhage occurred. As the patient's pulse became very feeble, the abdomen was closed as quickly as possible, the lower third of the wound being kept open by three long gauze drains. An intravenous injection of two pints of saline was given when she was put back to bed.

After operation the patient was incontinent, and did not retain glucose injections by bowel. On September 20 she had an attack of vomiting with distension of the abdomen. The gauze drains were removed on September 21, and a long piece of gauze soaked in flavine was inserted behind the uterus. There was a small quantity of lochia. On September 25 the temperature rose to 101.4 degrees. On September 27 a faecal fistula developed, and a piece of membrane presented through the wound. An attack of phlebitis in the left leg, which began on October 10, had completely cleared up on October 28.

When the patient was discharged from the hospital quite well on Feb. 3, 1919, the wound was completely healed.

**Dorman, F. A.: Two Cases of Abdominal (Ectopic) Pregnancy Operated upon Near Term with Living Children.** *Am. J. Obst.*, 1919, lxxix, 782.

The first case was that of a woman 29 years old who developed a toxæmia and was treated in the

hospital for three weeks without relief. Owing to the presence of several fibroids in the lower uterine segment, a cæsarean section was performed. Previous to the operation it was not known that the pregnancy was ectopic. The membranes were broken and the child extracted. As the bleeding was profuse, the sac was rapidly freed from the omental adhesions by ligature and cutting, and drawn up out of the abdominal cavity. It was then found to be connected with the right broad ligament of which apparently it was an extension. By clamp and ligature close to the base of the ligament, the sac was completely extirpated. Examination of the uterus showed that it was enlarged to the size of a three-months' pregnancy and there were four substantial fibroids in its posterior wall. A pedunculated fibroid about the size of a small grapefruit was attached to the left horn and another somewhat smaller to the right horn.

The uterine mass with its attached tumors was removed by clamps and ligature, leaving only the left ovary and the cervical stump. The broad ligament wound was sewed over with a continuous catgut suture, and after all bleeding had been controlled the abdominal incision was closed in layers. The child weighed 6 pounds, 14 ounces.

The second case was that of a woman who was seen by the author in consultation Sept. 28, 1917. The patient gave a history of sudden severe pain referred to the right side of the abdomen and was in a state of quite severe shock, as shown by a feeble, accelerated pulse. The condition had come on at night, and at first suggested sudden separation of the placenta. After the administration of morphine the pulse improved markedly. The patient was then about seven months pregnant. The last menses had occurred in February. During the second and third months there had been nausea and severe pain in the right side. At this time the patient had been in a hospital in a western town and had been told that she had an ectopic pregnancy and urged to submit to an operation.

On November 9, because of moderate albuminuria, she was sent to the hospital and kept on a careful diet. An operation was performed on November 17. The peritoneum was incised, exposing the foetal sac which was found attached to the omentum by several light adhesions. The presenting portion of the sac was incised and the hand, passing through the placental tissue, seized the head and extracted the child. The child was a female, weighing 4 pounds, 11 ounces. The incision in the foetal sac was closed with clamps and the sac drawn out of the abdominal cavity. The omental adhesions were cut between ligatures. After tracing the sac down to its origin in the left broad ligament, it was clamped off from the horn of the uterus and excised. Bleeding points were controlled by ligature. On the right side near the cæcum the sac was extensively adherent to the intestine. In the midst of this was a small mass of brownish blood clots which was obviously the cause of the attack



of pain and faintness that had occurred the previous month when the patient was first seen.

The sac was separated by blunt dissection from the adherent intestines and the clot removed. The hæmatoma was also walled in by the fundus uteri, which, moderately enlarged, extended upward in the right iliac fossa. A tear in the peritoneal coat of the uterus caused by the blunt dissection was closed with catgut, after which the abdomen was closed.

The postoperative history was excellent. The highest temperature was 100.6, but for ten days the pulse ranged above 100. On the twenty-third day the mother and child went home in good condition.

EDWARD L. CORNELL.

**Davis, E. P.: Therapeutic Abortion.** *Therap. Gaz.*, 1919, xliii, 389.

The writer holds that to justify the production of an abortion a condition must exist which renders the continuation of the pregnancy hazardous to the patient's life or is capable of terminating it. He finds the most frequent conditions demanding therapeutic abortion are the toxæmias of early pregnancy, pernicious nausea and vomiting, and inability to maintain the metabolism of the body. He would insist upon the most intensive observation of these patients by an intelligent caretaker so that there may be no error in computing the total intake and output and the total amount of nourishment retained for twenty-four hours. A precise record should be kept also of the general condition and symptoms. Accurate laboratory research including a nitrogen partition of a twenty-four hour specimen of urine will establish a positive diagnosis of toxæmia as all such cases show a profound disturbance in the nitrogen metabolism.

Heart lesions with evidence of decompensation are also held as furnishing grounds for therapeutic abortion. In discussing tuberculosis the author draws a sharp line between such infection acquired subsequent to pregnancy and an infection existing before pregnancy. In the former cases he believes the patient is more apt to respond to early treatment and that the pregnancy should be allowed to proceed as long as the improvement is noted. In the case of patients who were tuberculous before conception the pregnancy should be terminated at once. When religious belief or ecclesiastical authority would prevent the interruption of pregnancy, it is the duty of the physician to state the truth without reserve, placing the burden of responsibility for the final decision upon the conscience of the husband and wife.

As to the method, the author states that he prefers dilatation under nitrous oxide and oxygen, with solid dilators, curettage with a sharp curette followed by a uterine douche of 1 per cent lysol, and tamponade of the uterus and vagina with 10 per cent iodoform gauze. The packing should be removed in thirty-six to forty-eight hours when a free vaginal douche should be given. Subsequently the knee-chest posture is recommended and the administration of strychnia and ergot.

H. K. GIBSON.

**Bar, P.: The Place of the High Cæsarean Section in Obstetrical Operations** (Place qu'il convient d'attribuer à l'opération césarienne haute parmi les interventions obstétricales). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 571.

Bar's study is based on his personal experience in 275 conservative cæsarean operations performed either by himself or his assistants. Because of the favorable results obtained he has been led to perform the operation in cases in which formerly he would have thought it inadvisable. He does not perform it however upon women who show even slight signs of infection, increase in temperature, or vaginitis. His rule is also not to operate during labor unless at the beginning while the membranes are still intact. In the last 97 cæsarean operations performed he operated in only one case after the woman had been in labor for twenty-four hours, only once after the membranes had ruptured, and nine times after the patient had been in labor less than two hours. The other 85 operations were performed before the appearance of the first pains.

Bar always operates with the patient in the Trendelenburg position and packs off the uterus. The uterine incision is made very high on the anterior surface and the ovum is extracted without rupturing the sac. The technique is simple. A buttonhole incision having been made in the uterus, the finger is introduced and the membranes stripped as far as possible. The uterus is then sectioned while the finger proceeds with the stripping of the sac. If the placenta is inserted low or in a cornu the sac may tear but the extraction should be carried out as usual. Bar no longer tampons the uterus. Experience has shown that secondary hæmorrhages are rare, and they occurred only once in the last 37 cases. In 22 of the 97 cases the operative hæmorrhage was little or nothing, in 10 it was considerable, and in 65 medium in amount. While in the author's opinion immediate hæmorrhage need not be greatly feared, he takes the precaution of injecting 20 drops of ergotine subcutaneously.

In only 2 cases was an extraperitoneal cæsarean section done. The claim that in the low operation the hæmorrhage is slight does not count for much according to the figures quoted by Bar. The more important claim that the infection is less apt to spread is very valid for those who operate by the high route without selecting their cases, but has little weight when the cases are carefully selected as in this series. Rupture of the uterine wall in a subsequent pregnancy is more to be feared after a low than after a transperitoneal uterine section. Such a rupture also depends on the suturing.

Of 97 patients operated upon by Bar by the high abdominal route during the past five years one had slight shock, one a tendency to intestinal occlusion, and others an increase in temperature, etc. All 97 patients, however, finally left the clinic well and able to nurse their children.

The mortality which thirty years ago was above 10 per cent is at the present time 2 or 3 per cent.



Experience continues to emphasize the fact that a caesarean section should be performed only in non-infected cases and that no case can be regarded as uninfected when the woman has been in labor a long time and the membranes have been ruptured.

When performed in selected cases by skillful hands following a simple technique on women not threatened by infection, caesarean section is an operation which gives an almost certain successful result for both mother and child.

Bar next takes up the question of end-results, i. e., postoperative adhesions and the possibility of future ruptures of the uterus. When the operation is performed upon non-infected patients the adhesions are slight and do not offer difficulty in future interventions. The risk from adhesions in these cases, therefore, is so little that it may be considered of secondary importance. With regard to subsequent rupture of the uterine wall in the site of suture, the author states that in 22 cases in which the caesarean was repeated there was 1 perforation and in 21 a greater or less degree of thinning of the wall about the scar. It cannot be denied, therefore, that a notable thinning of the uterine wall is frequent, but this can be obviated to a great extent by care in suturing. The suturing should be wide and deep, the threads passing well into the mucosa. Infection is avoided by selection of cases. In Bar's experience a woman who has undergone a caesarean operation is not exposed to any serious risk of uterine rupture.

The indications for the caesarean section should be definite and the operation should never be performed in their absence. It is a serious surgical procedure but the results are very satisfactory when it is reserved for only those cases in which extraction by the natural route is clearly impossible or particularly dangerous.

Caesarean section is legitimate in all cases: (1) when an obstruction arising from the bony pelvis or the soft parts indicates that expulsion will be difficult and that a forceps extraction or extraction after version will be necessary, and (2) when some accident renders a rapid termination of the pregnancy or labor particularly desirable before natural labor sets in. Common to all indications is the reservation that the operation should be performed only when there is no risk of infection.

In the final part of his article Bar discusses some of the accidents threatening pregnancy and labor, such as placenta prævia, eclampsia, etc.

W. A. BRENNAN.

**Conaway, W. P.: Caesarean Section for Unusual Conditions.** *Am. J. Obst.*, 1919, lxxix, 778.

The first patient, a primipara 41 years old, had had peritonitis for ten days due to acute appendicitis. Attempts at vaginal delivery had been made unsuccessfully. The classic caesarean section was then performed with the delivery of twins. For a week after delivery the patient had chills and a fever of 104

degrees. Drainage of a cul-de-sac was followed by recovery and the discharge of the patient twenty-seven days later.

The second case was that of a primipara 35 years of age who had intestinal obstruction with a temperature of 101 degrees due to appendicitis and salpingitis with no free pus. After caesarean section the convalescence was stormy for one week. The patient was discharged in one month.

The third case was that of a woman, a primipara aged 30. Caesarean section was required because of a breech presentation in which the head failed to pass the inlet. After several attempts to deliver the child, it was thought better to perform a caesarean section even if the foetus were dead, rather than a decapitation, because it was quicker and safer. A gauze drain was left in the uterus. The patient was discharged from the hospital in three weeks.

The fourth patient, 20 years old, who was also a primipara, was operated upon for eclampsia. The convalescence was normal except for a phlebitis which lasted ten days.

EDWARD L. CORNELL.

## LABOR AND ITS COMPLICATIONS

**Ramsay, B. L.: Twilight Sleep: Its Present Status.** *Illinois M. J.*, 1919, xxxv, 297.

Twilight sleep has been successful in the hands of some and a failure when used by others. Authorities are about equally divided for and against it, but all agree that it has an element of danger for the foetus.

The condition is induced by the use of morphine sulphate and hyocine hydrobromide. Narcophin is claimed by some to be less toxic than the former. The object of the procedure is to produce analgesia plus amnesia, an ideal state not always attained. To determine the degree of analgesia plus amnesia possible in the mother without grave risk to the foetus, the susceptibility of the patient to the drug, the condition of the foetal heart, and the degree of pain present must be determined. The indications for twilight sleep are: (1) nervousness, (2) cardiac lesions, and (3) slow and excessively painful dilation of the cervix. The doses of the drugs recommended are, morphine sulphate 1/6 grain, hyoscin hydrobromide 1/100 grain, and atropine sulphate 1 to 1/180 grain, given subcutaneously, the hyoscin being repeated.

The first dose is administered when there is great pain, providing the dilation is the width of two fingers or more, so that manual dilatation and forceps delivery can be resorted to if necessary. As soon as the effect of the first dose begins to wear off the second dose is given after careful examination of the condition of the foetal heart. When effects on the foetal heart are noticed forceps are used at once.

Twilight sleep seems to have no effect upon post-partem contractions or hæmorrhage and does not delay recovery. Many of the babies are drowsy, especially if delivery is completed within three hours of the first injection. The lack of muscle assistance is counterbalanced by the relief of suffering, but the necessity for the application of instruments, especially



low forceps, is more frequent. Labor is materially lengthened in only a few cases. This method of delivery is not recommended as a routine procedure.

F. H. HARMS.

**Icasalegui, M. P.: Two Cases of Acute Pulmonary Oedema during Labor and in the Puerperium** (Dos casos de edema agudo del pulmon en el parto y alumbramiento). *Guipúzcoa med.*, April, 1919 (from abstract in *Med. Ibera*, 1919, vii, 1491).

The first patient to whom the author refers suddenly showed an expression of extreme anguish during the expulsive period. The respiration became rapid and stertoric and was accompanied by the expectoration of a serosanguineous liquid. The uterine movements were paralyzed. In view of the alarming situation the author applied the forceps at once.

After the extraction of the foetus the symptoms of oedema re-appeared but subsided upon the withdrawal of from 300 to 400 grams of blood.

In the case of the second patient who showed similar respiratory difficulty the author immediately withdrew about 400 grams of blood with an instantly favorable result.

The cause of the pulmonary oedema was neither in the lung nor in the heart and the urine showed nothing abnormal on analysis. In the case of the second patient the sphygmomanometer demonstrated that the cause of the pulmonary oedema was arterial hypertension.

These cases led the author to the following conclusions:

1. The only valid treatment for acute pulmonary oedema, whatever its cause, is a general blood-letting to the extent of 300 or 400 grams.
2. Suction and cupping appliances do not act sufficiently in cases of oedema and such methods should be employed only when blood-letting is contra-indicated.
3. It is the duty of the obstetrician to examine and prepare the patient carefully so that if blood-letting is necessary she may be in the best condition to struggle against the complications which may follow.

W. A. BRENNAN.

**Anderodias, I.: Fibroma of the Lower Uterine Segment and Spontaneous Labor** (Fibrome du segment inférieure de l'uterus et accouchement spontané). *J. de méd. de Bordeaux*, 1919, xc, 167.

The patient in the case reported was a woman 41 years old, a primipara, with nothing of particular interest in her history. Except for the four previous years, her menstruation has been very irregular. The woman came to the hospital in labor, presenting in the lower pelvis a tumor which was apparently the cause of a dystocia.

On examination a tumor the size of a large foetal head and quite distinct from the foetus could be felt easily in the lower part of the pelvis. The diagnosis made was "sessile fibroid complicating labor."

While at first it seemed that a spontaneous de-

livery under such circumstances would be impossible, the author determined to await further developments. After five hours the midwife in charge informed him that in spite of energetic contractions the labor did not progress. He therefore decided to perform a cesarean section. His examination of the patient, however, did not corroborate the midwife's report as he found that instead of being entirely pelvic as before the tumor had moved into the left iliac fossa. It had been pushed up and to the side. The foetal head had also become turned toward the cavity. Under these circumstances the author determined that there was every possibility of a spontaneous labor and therefore deferred operation. After a few hours more dilatation was complete, the head engaged, and the child which weighed 2,850 grams, was born after a period a little longer than five hours.

In such cases the tumor may be pushed down through the vulva by the foetus or upward and to the side as in the case reported. According to the author the latter occurs as the result of two factors both due to the uterine contractions: (1) the elongation of the inferior segment of the uterus, and (2) the dilatation of the cervix.

Such ascension of a fibroma may take place in the final months of pregnancy. The cervical dilation draws the tumor toward the periphery of the pelvic cavity where it sometimes slides into the iliac fossa, leaving the passage free for the foetus.

A contingency such as that described, however, must not be awaited too long. If after a reasonable delay the tumor shows no tendency to move, and especially if the foetal heart sounds begin to weaken, a cesarean operation must be resorted to without further delay.

In the case reported the placenta and membranes were expelled forty minutes after the birth and there was no hæmorrhage. The woman left the hospital eight days later in good condition and by that time the tumor had very greatly diminished in size.

W. A. BRENNAN.

**Rongy: Intrapartum Rupture of the Uterus.** *Am. J. Obst.*, 1919, lxxix, 824.

The patient, a primipara 32 years of age, had a negative family and personal history. She became pregnant fifteen months after her marriage and expected to be delivered Aug. 2, 1918. On August 4 she was sent to the hospital because of vague pains. These pains, which were irregular, lasted about three hours, then ceased, and did not recur until the following morning. About noon on August 5 the author was called in consultation.

At that time the patient was somewhat shocked and her pulse, which was of fairly good quality, was 115. The pelvic measurements were normal. No foetal heart sounds could be heard. On vaginal examination the head was found to be engaged in the pelvic inlet and the cervix undilated. Abdominal examination revealed peculiar unevenness of the uterine mass and some fluid in the flanks.



On opening the abdomen both legs of the infant were found protruding into the abdominal cavity through the fundus of the uterus. The rent was irregular and extended from side to side across the upper margin. The child and placenta were quickly extracted, the body of the uterus was amputated at its middle portion, drains were inserted in each cul-de-sac, and the abdomen was closed. The patient rallied from the operation but later developed sepsis and died on the fourth day. The removed portion of the uterus was sent to the laboratory where no changes in the uterine wall could be found which would account for the rupture.

EDWARD L. CORNELL.

### MISCELLANEOUS

**Romero, J.: The Characteristics of the Pelvis of the Peruvian Woman** (Contribución al estudio de las características de la pelvis de la mujer peruana). *Crón. méd.*, Lima, 1919, xxxvi, 118.

From 1914 to 1917 inclusive the measurements obtained of the pelvis of 1,116 parturients examined in the author's obstetrical clinic showed that 12.66 per cent had abnormal pelvis. This is about the same as in other countries. The conjugate vera was never less than 7.5 centimeters.

The author believes that this study of the Peruvian female pelvis is of interest not only from a scientific standpoint but also because foreigners in dealing with Peruvian pathology have based it on incorrect data. Similar data has been compiled in other South American countries.

The author gives in detail the typical measurements of the pelvic dimensions compiled during the last four years. Many of these women had had normal labors despite varying degrees of pelvic abnormality.

W. A. BRENNAN.

**Lowenburg, H.: Hæmorrhage of the New-Born; Blood Transfusion Via the Longitudinal Sinus; Recovery.** *J. Am. M. Ass.*, 1919, lxx, 1615.

The author reports the case of a baby girl, two days old, who was admitted to the hospital while bleeding profusely from the mouth, nose, and rectum. The cause of the hæmorrhage was indeterminable. The following day about 80 cubic centimeters of whole blood were transfused directly from the donor into the longitudinal sinus. A second transfusion proved to be unnecessary. In almost one month's time the hæmoglobin increased 60 per cent.

E. C. ROBITSHEK.

**Laase, C. F. J.: Narcotic Drug Addiction in the New-Born.** *Am. Med.*, 1919, xiv, 283.

Laase reports the case of a woman 27 years of age, of good general and physical condition, who was addicted to opiates for over two years and had an uncomplicated and uneventful pregnancy. Its course was uninfluenced so long as an opiate drug was supplied in quantities necessary to maintain her free from the symptoms of the withdrawal of the narcotic or body need for opium. Labor was accomplished when she was practically in a condition of drug need. When it was finally completed, she was in a highly excited state, very restless, and suffering from the usual distress of opiate need. Just before the final pain she attempted to jump out of the window to end the misery of combined labor pains and opiate deprivation. The labor pains were very energetic and delivery was accomplished with little difficulty.

The baby was a well-nourished child which appeared healthy but from the moment of birth was very restless. Symptoms and signs of drug need developed in the infant which were identical with those of the mother both in character and sequence. The restlessness increased and the child began to yawn and sneeze. Its face became pinched and its color poor. It drew up its legs and cried out as if in pain. Its pupils became widely dilated. The chin was in a constant tremor. Finally diarrhoea began and there were signs of collapse with general convulsions.

Nothing seemed to alleviate these symptoms until a drop of paregoric in water was given. They then disappeared in proportion to the amount of drug administered, those which developed last going first.

When the administration of the opiate was delayed the symptoms developed at intervals of about eight hours, their severity varying with the length of the delay. After lactation was established the necessity for the paregoric ceased as the narcotic was supplied through the mother's milk. Just before the nursing time the child displayed a restlessness unlike that seen in normal children. Immediately after nursing this subsided. Reduction in the opium intake in the mother was reflected immediately not only in her own physical condition but also in that of the nursing infant. It seems to the author that the manifestations were purely physical and explained by Bishop's theory of the production of an antidotal toxic substance rather than by psychiatric or psychologic approach.

F. H. HARMS.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Sharples, C. W.:** Ruptured Cystic Kidney. *North-west Med.*, 1919, xviii, 109.

Sharples reports the rupture of a monocystic kidney in a man under 30 years of age which occurred while he was wrestling. The onset of pain was immediate and intense. The symptoms were those of rupture of an intraperitoneal viscus, but operation failed to reveal it and the abdominal incision was closed. The right kidney was then exposed through a lumbar incision, drainage was instituted, and recovery was uneventful save for phlebitis in the left leg. The marked symptoms of shock and pain are attributed by the author to the effect of the rupture upon the sympathetic nervous system. The cyst contained approximately one pint of fluid.

J. S. EISENSTAEDT.

**Lozano, E. F.:** The Bloodless Treatment of Painful or Essential Hæmaturic Nephritis (Tratamiento no cruento de las nefritis dolorosas o hemáturicas esenciales). *Rev. españ. de cirug.*, 1919, i, 231.

Cases of the so-called essential hæmaturic nephritis are not distinct anatomopathologic entities, but, according to the majority of authors, are manifestations due to excessive intrarenal pressure which compresses the glomeruli and stretches the nerve fibers. Acting on this hypothesis, different surgeons have endeavored to diminish the excessive intrarenal pressure by a variety of methods ranging from simple exposure of the kidney by the lumbar route to renal decapsulation.

Lozano believes that the intrarenal pressure can be reduced without the least operative traumatism by injecting a very concentrated solution into the kidney by means of ureteral catheterization and placing the patient in the Trendelenburg position. He has carried this method out experimentally in rabbits and is satisfied that it can be applied clinically.

In his experiments after chloroforming the animal Lozano performed a laparotomy exposing the kidneys and brought about an intense passive congestion in the right kidney by compressing the renal vein. This caused an increase in the volume of the kidney and a great increase in the intrarenal tension. Under these conditions the kidney was submerged in a saturated solution of sulphate of soda. Immediately there followed a marked change in its size and appearance, a phenomenon which was due to osmosis between two fluids of different concentrations, i. e., the solution of sulphate of soda of greater concentration and the intrarenal secretion of lesser, which interchanged through the renal tissues.

The method is practicable clinically when the fluid reaches the kidney pelvis after ureteral catheterization, and is indicated in essential hæmaturia and other renal conditions of a hæmorrhagic nature.

In answer to a criticism that the nervous system as well as the vascular system is involved in essential hæmaturia the author points out that the relief of the congestion removes the causes of nerve tension and the symptomatic pains cease. Such hypertonic ureteral injections he believes are innocuous and may be repeated whenever there are painful or hæmaturic crises.

W. A. BRENNAN.

**Perearnau, E.:** Nephrectomy for Bilateral Renal Tuberculosis. Results After Three Years (Nefrectomía por tuberculosis renal bilateral. Resultado a los tres años). *Rev. españ. de cirug.*, 1919, i, 233.

In bilateral renal tuberculosis nephrectomy is a last resort when all other methods, especially treatment with tuberculin fail, and when the sufficiency of the remaining kidney is assured.

The operation reported was the first of its kind published in the literature of Spain. The right kidney of the patient was removed after complete proof of the functional capacity of the left kidney was obtained. The third day after the operation there was a slight uræmia which was easily overcome. During the eighth month a slight cystitis developed. At the end of a year ureteral catheterization showed that the pyuria and the Koch bacilli were of renal origin. At the end of two years it was noted that the urine was less purulent, and that there was neither dysuria nor polyuria. The patient was given frequent injections of tuberculin. Either this treatment or his constant open air life may explain the clearness of the urine, the negative kidney exploration, and the absence of any disturbance which were demonstrated at a recent examination.

W. A. BRENNAN.

## BLADDER, URETHRA, AND PENIS

**Marlier:** Clinical Observations for the Study of Inguinal and Crural Cystoceles (Faits cliniques pour servir à l'étude des cystocèles inguinales et crurales). *J. de méd. et chir. prat.*, 1919, xc, 377.

The author calls attention to the cystoceles with or without sacs in the inguinal and crural regions which are often discovered during operations for hernia. Two of the three cases of which he gives the histories were cases of extraperitoneal cystoceles without sacs, i. e., a variety of bladder hernia which was discovered while he was searching for a hernial sac. Believing the cystocoele to be the hernial sac,



he opened it. Such an error is especially apt to be made in the crural region as hernial sacs here are frequently thick and fatty.

In the first of the two cases reported the symptoms were such as to suggest the diagnosis of strangulated omental hernia. The true nature of the cystocele was discovered only when a jet of urine escaped through the incised wall. In the second case the cystocele was believed to be a small crural hernia involving the intestines and was discovered in the course of a radical operation for an old inguinal hernia.

A second variety of cystocele, i.e., with an incomplete sac or a paraperitoneal cystocele, is sometimes found in the inguinal region especially in old persons with prostatitis or stricture and in women with abdominal tumors. The author's third case was a crural cystocele of this type.

A third variety—the intraperitoneal cystocele—is very rare, always situated in the inguinal region, and of voluminous size. The herniated bladder is contained in an ordinary hernial sac together with an intestinal loop or portion of omentum which resembles a second sac contained within the first. A typical case of this kind may show a large cystic pocket in the hernial sac and in the rest of the sac the herniated intestine. The cystic pocket will be found to be a continuation of the bladder. There are no typical symptoms upon which the diagnosis of such a cystocele may be based. The herniated bladder is usually connected with the main organ by a narrow, stretched pedicle, and fluids injected into the bladder will not always reach the diverticulum.

Alessandri in reporting the statistics of 175 cases stated that the diagnosis was made before operation in only 5, in the course of operation without injury to the bladder wall in 71, during operation with injury to the bladder in 76, and not made even during operation in 23. The symptoms arising from a cystocele resemble those of an ordinary strangulated hernia but are less marked and are limited to abdominal pain, vomiting, tension, and irreducibility of the tumor.

If during operation the appearance of a hernia suggests anything unusual, it is well to make a small exploratory puncture of the contents with a Pravez syringe.

W. A. BRENNAN.

**Rezende, C. de: The Treatment of Vascular Urethral Caruncula by Chromic Acid** (Tratamento da caruncula vascular da urethra pelo acido chromico). *Brazil med.*, 1919, xxxiii, 84.

Since 1915 de Rezende has seen five cases of urethral vascular caruncula. The first case was that of a woman aged 65 years. In one case the patient, a woman, had been reduced almost to a skeleton and had borne the excruciating pain in the urinary canal for twelve years rather than submit to examination and operation. In this case therefore, owing to the objection to operation, the author treated the papilloma with chromic acid; after the induction of local anæsthesia of the urethral canal, he destroyed the tumor by puncturing it

repeatedly with a probe dipped in the chromic acid. When the growth had disappeared he cauterized the site in the same way, neutralizing any excess acid with sodium bicarbonate. There was no hæmorrhage and the whole procedure was effected without appreciable pain. The woman's condition has been good during the two years which have passed since the operation was performed.

In another case in which the author destroyed the caruncula with the actual cautery pain was felt for several days and was due evidently to the action of the heat on the surrounding tissues.

The author cannot find any report in the literature of the use of chromic acid for the treatment of this affection, but the literature available to him is very limited. Possibly it is not new. W. A. BRENNAN.

**Stern, M.: Four Cases of Urethral Stricture with Acute Retention of Urine Treated Successfully Without External Urethrotomy.** *Internat. J. Surg.*, 1919, xxxii, 180.

The first case was that of a man who was in a very poor general condition with almost complete retention of urine and an extremely distended bladder. Cystotomy with the insertion of a drainage tube was done, the anæsthetic used being gas-oxygen. After several days' rest in bed, during which time the suprapubic drainage was continued and warm urethral irrigations and instillations of argyrol solutions were made into the urethral orifice, the patient was able to void freely. At the expiration of ten days the instillation tube entered the stricture without difficulty and wider dilatation was effected without interruption.

The second case was that of a man 54 years of age with a twenty-year history of stricture. His temperature was septic and there was urinary extravasation. Free incision of the infiltrated area and suprapubic drainage were performed with results about the same as those in the first case.

The third patient, who had never experienced acute retention before, was found to be in a very serious condition on admission to the hospital. The urethra was badly traumatized and there was complete retention. Cystotomy was performed and in two weeks the suprapubic wound was allowed to close.

In the fourth case there was a history of previous external urethrotomy. The passing of sounds was neglected and the gradual decrease in the urinary stream culminated after six months in complete closure. In this case a modification of Russel's operation was done.

In his conclusions the writer states that in the first three cases palliative treatment of the area of stricture gave results far superior to those which could have been expected from external urethrotomy both as to mortality and surgical outcome. In the fourth case the ultimate result of external urethrotomy was demonstrated to be inferior to that of palliative treatment when carefully carried out.

The advisability of palliative or local surgical treatment is to be decided upon after the urine has



become clear and the symptoms of irritation at the vesical neck and external sphincter have been eliminated, and in this we must be guided by the occupation, habits, and social status of the patient and the effect of instrumentation upon the stricture area. When the infiltration is deep and unyielding as in the cicatricial variety, the indications are for local surgery rather than palliative treatment.

In cases amenable to palliative treatment the results are excellent. The dilating irrigator causes the absorption of strictures through the agency of long irrigations of warm water accompanied by dilatation.

In the operative treatment Russel's partial resection, Marion's radical resection, and Cabot's plastic operation have advantages in their respective fields. In order to determine which would be best in a given case the membranous urethra and the bulbous and prostatic portions for about one half inch in front and behind it must be freed and examined.

LOUIS GROSS.

### GENITAL ORGANS

**Pirondini, E.: The Functional Classification of Cases of Prostatitis and Freyer's Operation** (Suddivisione funzionale dei prostatiti e operazione di Freyer). *Polidlin.*, Roma, 1919, xxvii, sez. chir., 113.

On the basis of the renal function, cases of prostatitis may be classified into three groups, or better, according to three stages. While such a division is not quite in accordance with the classical subdivisions, it is to be preferred for therapeutic purposes.

In cases of prostatitis of the first functional stage the urine is clear. Such patients should be operated upon in one stage unless there are definite changes in the viscera. Those who have severe secondary infection should be operated upon in two stages separated by a short interval of time.

Cases of prostatitis of the second functional stage are those in which the anatomical and functional alterations, though advanced, are at least in part mechanical and still reparable.

Prostatitis of the third functional stage is that in which there is prolonged chronic retention and in which the dominating renal changes are old, atropic, and sclerous in character. In such cases the injury to function is irreparable or at the best only very slightly reparable.

In some cases of prostatitis of the second stage it may be possible to operate in one stage, but as a general rule these cases, and always those of prostatitis of the third degree, should be operated upon in two stages following prolonged preparatory periods consisting of a preliminary period in which a permanent catheter is used and an interval period of suprapubic drainage. As a rule the second period may be shorter than the first.

In cases of prostatitis of the third stage the preparatory course is often less efficacious than was

expected. At times the improvement of the general state is much greater and more regular than that of the renal function. In these cases great success has been obtained with the Freyer operation done in two stages. Patients operated upon in this way may live a long time without showing any phenomena of renal insufficiency. It is very probable, however, that this is simply a clinical latency rather than true functional equilibrium.

W. A. BRENNAN.

**Geiringer, D., and Campuzano, J.: An Interesting Case of Prostatic Obstruction** (Un caso interesante de obstruccion prostatica). *Rev. de med. y cirug. de la Habana*, 1919, xxlv, 136.

The author states that anterior obstructions of the prostate, i.e., obstructions in the urethral rather than the vesical part of the internal sphincter, are difficult to diagnose. These constitute the class of cases in which the obstruction is due to hypertrophy of Albarran's glands.

The author reports a case which was that of a man 64 years of age. The urethoscopic examination showed an oval elevation of the floor of the posterior urethra extending from the verumontanum to the neck of the bladder. There was no lateral compression of the urethra. A suprapubic operation was done and the adenoma removed.

W. A. BRENNAN.

**Watson, E. M.: The Status of the Vesical Sphincter after Prostatectomy.** *Surg., Gynec. & Obst.*, 1919, xxviii, 569.

The two chief factors which should be considered in explaining unsatisfactory function after prostatectomy are (1) the incomplete removal of the obstruction, and (2) too extensive trauma to adjacent parts incident to removal of the hypertrophied lobes.

The part played by the internal or vesical sphincter and the external or urethral sphincter has long been a subject of much diversity of opinion. At the present time it is generally believed that the internal sphincter marks the normal closing point of the bladder.

Hyman has recently given a very conclusive study of the resulting changes at the bladder outlet following suprapubic prostatectomy by means of collargol cystograms. In a series of 38 cases he found that 28 showed two distinct cavities after operation—the bladder cavity, and, continuous with it, the cavity from which the prostatic adenoma was removed. In these cases the external sphincter marked the closing point of the bladder. Of the remaining 10 cases a few showed a very slight funnel formation and the rest no change from the normal. Hyman states that the internal sphincter was destroyed by operation or its formation so impaired that it could not have had any effect in retaining the fluid in the bladder.

From Hyman's study it is readily seen that though the internal or vesical sphincter is destroyed in the majority of cases of suprapubic prostatectomy, no



incontinence follows. Yet under normal conditions this same vesical sphincter is the muscle which holds the urine in the bladder. Occasionally, however, we meet with a person who has continued incontinence following this operation. The only explanation is that in removing the hypertrophied lobes an unwarranted amount of trauma was done to the posterior urethra, i. e., its involuntary musculature, in addition to permanent injury of the internal sphincter. The action of the external sphincter, a purely voluntary muscle and directly under the control of the will, can hardly be accredited with the power of remaining tonically contracted for a period long enough to give normal urinary continence.

By reason of the approach through incisions in the posterior lobe and oftentimes the successful enucleation without rupture of the bladder mucosa the method of removing the prostate through the perineum seemed to offer possibilities for observation of the vesical outlet under conditions quite different than those following suprapubic prostatectomy. For the purpose of this study 25 cases were obtained from the clinic of the James Buchanan Brady Urological Institute. The recent cases were those of convalescents in the hospital and the older cases were those of patients living near by. The operation performed in every instance was Young's conservative perineal prostatectomy done by Young or one of his staff.

In every instance the beginning of interval urination, which from a functional standpoint indicates the return of control in the internal vesical sphincter, was noted. The study of the vesical orifice was made in these cases by means of cystograms taken some time subsequent to operation, i. e., from three weeks to thirteen years afterward. These were made after filling the bladder with 10 per cent thorium solution through a catheter as recommended by Burns. The bladder outlines and particularly the region of the prostatic orifice were studied for evidence of dilatation as shown by the escape of the thorium solution into the posterior urethra.

The author summarizes his paper as follows:

From a study of the cases herewith reported it is seen that following perineal prostatectomy the internal or vesical sphincter returns to its normal tone and function in every instance.

This takes place within a few weeks as demonstrated by the accompanying cystograms. From clinical observations there may be an even earlier return of function, judging from the establishment of definite intervals of urination a few days after

prostatectomy has been performed with a perineal urethrotomy in the membranous urethra back of the interval sphincter as it should be. Not infrequently urine is voided at three- and four-hour intervals at this period through both the urethra and the urethrotomy wound, while during the intervening time the patient is perfectly dry. These rather long periods of complete continence could not occur under the conditions described if the vesical sphincter were not functioning normally. THEODORE DROZDOWITZ.

**Herbst, R. H.: Cancer of the Prostate; a Combined Surgical and Radium Method of Treatment. *J. Am. M. Ass.*, 1919, lxxii, 1610.**

By the use of radium embedded in the carcinomatous prostate at six different points the author has obtained excellent clinical results. His technique consists of exposing the prostate suprapubically and placing the radium into the prostatic mass through the bladder. Six weeks to two months later the prostate is exposed perineally and the radium again placed in the gland in a similar manner. In the one case reported in the article the result was all that could be desired.

V. D. LESPINASSE.

#### MISCELLANEOUS

**Stein, A.: A Case of Atypical Male Sex Ensemble. *Med. Rec.*, 1919, xcv, 902.**

The author reports the case of a pseudo-hermaphrodite of male type, 31 years of age, who wished to lead the life of a woman. It was not considered advisable, however, to undertake any operation either to form a vagina or fix the undescended testicle on the left side.

Although the general appearance was that of a normal, well-built woman, local examination showed the presence of a rudimentary penis, hypospadias, an undescended testicle on the left side, a descended testicle on the right side, the absence of internal female genitals, as was shown also in a previous laparotomy, and absence of the prostate gland.

The psychic female sex attitude of this subject was probably essentially the outcome of early environment and rearing as a girl. The author points out that although from one view point sex is decided by the anatomical character of the gonad or sex gland, the development of the psycho-sexual center is given an extremely wide scope through education, example, and suggestion.



# SURGERY OF THE EYE AND EAR

## EYE

**Lawson, A.: Flavine in Ophthalmic Surgery.**  
*Lancet*, 1919, cxcvi, 1112.

At the present time flavine is sold on the market as acriflavine, and also as proflavine. Acriflavine is the methylchloride of the organic compound di-amino-acridine, whereas proflavine is the hydrochloride or sulphate of the same base and a preliminary product in the manufacture of acriflavine. Both are yellow dyes which are extremely potent antiseptics, but their bactericidal action unlike that of other powerful antiseptics in common use—such as the phenols, mercuric chloride, and eusol—is enhanced rather than diminished by admixture with serum. Further, they are comparatively non-toxic, both locally as regards the tissues at the site of application and generally as regards the body as a whole after absorption. Proflavine appears to be the preferable compound when dealing with the conjunctiva. For general purposes in eye-work a solution of proflavine of a strength of 1:1,000 in normal saline was adopted by the author.

Lawson emphasizes the absolutely non-irritating effects of proflavine when applied to any wound surface, clean or otherwise, solutions of a strength of 1:1,000 being absolutely painless to even the most acutely tender eye.

The use of flavine is not to be insisted upon as a necessary routine for every operation, though the author has employed it routinely during the last twelve months. There are four classes of wounds in which he has found it to be of the highest value:

1. Wounds caused by foreign bodies. In the two years during which flavine has been employed he has not had a single case among the many wounds he has treated in which there was any trouble due to sepsis.

2. In all operations requiring the use of sutures. If during the wound healing the effects of flavine are required for a week or so, a stronger solution than 1:4,000 is not to be recommended.

3. When operative measures are necessary in some cases of perforation of the cornea with extrusion of the iris, and in a certain number of cases of acute congestive glaucoma. In such conditions a solution of 1:1,000 is to be preferred to a weaker solution.

4. Wounds in which grafts have been used. In such cases flavine is invaluable as a dressing. Strips of gauze well soaked in it should be laid over the graft when applied. This dressing need not be touched for several days.

In inflammatory conditions of the eye, the inflammation will be checked and its progress limited by flavine though if of any severity it will not be cured. Flavine is not to be relied upon to cure conjunctivitis. If it is used at all it must be as an adjunct to other

measures. Possibly because flavine has little power to penetrate the epithelial surface, it has only a very limited use in ophthalmia neonatorum and other kindred acute conjunctival disorders. The author believes it would prove to be of great value in preventing the onset of gonorrhoeal ophthalmia and a far better and safer preventive measure than the use of silver nitrate in the eyes of new-born babies.

D. C. BALFOUR.

**Brewerton, E. W.: Case of Angioma of the Retina.**  
*Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Ophth., 20.

Brewerton reports a case of cavernous angioma situated in the inferior nasal quadrant of the left retina. The patient's vision was 6/9 partly, and the only symptom floating spots which had been noticed since 1913.

The angioma was an oval, slightly swollen, pale pink mass about twice the size of the disk and bordered above by a dark red rim. The inferior nasal artery was much distended, tortuous, and varicose, but its branches were normal; toward the periphery it became larger and was lost on the lower nasal side of the angioma. From the nasal side of the mass a much distended vein passed upward in a tortuous route and suddenly became contracted just before it opened into the inferior temporal vein. Below the contraction there was white exudate on the nasal side. The common venous trunk remained normal for a short distance and then suddenly dilated and remained distended for the rest of its course.

The author believes that the vein was distended by mechanical factors and was not diseased; that there was a congenital fault in the capillaries of part of the retina which caused them to dilate into cavernous spaces. Indicating the absence of disease, he says, is the fact that its branches were normal in size and general appearance. In such cases there is danger of recurrent retinal hæmorrhage from the vein, with gradual permanent loss of vision.

W. F. MONCREIFF.

**Hallett, D.: Cataract Extraction by the Intra-capsular Method: Advantages and Technique.**  
*Hahneman. Month.*, 1919, liv, 321.

The removal of the cataract in its capsule by the technique of Major Henry Smith as modified by the use of the Fisher lid hooks and in some other minor details has several advantages. By abandoning all mechanical spring specula in favor of the separate lid retractors held by the assistant the escape of vitreous fluid is reduced to a minimum. Retention within the eye of portions of the capsule and cortical substance, the most common cause of postoperative inflamma-



tion, is obviated by extraction in the intact capsule. There is no opaque substance remaining in the pupillary area. Many additional months or years of good vision may be given the patient by extracting the immature cataract as soon as it interferes with useful vision. The author believes that in this method there are no dangers greater than those in other methods.

A preliminary iridectomy, ten days previous to the lens delivery, facilitates the latter procedure from a technical standpoint and has the further advantage of demonstrating to the patient that an operation upon the eye can be painless. It thus promotes a more tranquil frame of mind and body and better co-operation on the part of the patient for the extraction of the cataract.

Complete details of the preparation of the patient, the instruments, the technique of the operative procedure, and the after-treatment are given. The author's method does not vary in any important respect from the modification of Smith's technique as described by Vail, Fisher, and others.

A series of 48 consecutive intracapsular extractions made by the author is tabulated and summarized. The capsule was intact in 44 cases. Of the 4 cases in which a part or all of the capsule remained within the eye, there was a subsequent iridocyclitis in 2, and in 2 a prior chronic glaucoma. In only 5 cases was there a loss of vitreous, 4 following and one preceding delivery of the lens. In each of these cases the final vision was 20/30 or better. Glaucoma was a prior complication in 6 cases, in 2 of which a final vision of 20/30 or better was secured. In 4 cases there was a postoperative iridocyclitis and in one of these the eye was lost. There were 22 immature, 23 mature, 2 nuclear, and 1 hypermature cataracts. A preliminary iridectomy was performed in all but 1 case. The iris was caught up by one pillar in 8 cases, and by both pillars in 2 cases; none required any further surgery. Of the entire series of 48 cases the vision obtained was 20/40 or better in 79 per cent, 20/30 or better in 70 per cent, 20/25 or better in 56 per cent, and 20/20 or better in 48 per cent. Of 8 patients whose final vision was 20/70 or poorer, only 2 had a possibility of good vision owing to prior complications. The visual results in the remaining 40 cases averaged 20/25.

W. F. MONCREIFF.

**Tooke, F. T.: Tuberculous Iridokeratitis—Some Features in Its Pathology.** *Am. J. Ophth.*, 1919, ii, 395.

The author reports four cases of tuberculous iridokeratitis, with the clinical features, complete detailed descriptions of the histopathology, and excellent cuts. The pathologic material consisted of three enucleated eyes and one clot of organized exudate removed from the anterior chamber in a case which progressed to recovery.

Parsons' classification of tuberculous lesions of the iris is quoted: (1) miliary tubercle, (2) confluent or conglomerate tubercle, (3) tuberculous iritis. Tooke's

four cases are examples of the latter group, which is distinguished by chronicity as compared with the more acute lesions of Classes 1 and 2. In the type under discussion, which according to Parsons is the most rare form of the three, there is generally a diffuse infiltration and thickening of the iris. There may also be giant cells, but tubercle systems are not necessarily evident. The author has not always found the tuberculin reaction positive. In the series reported, tubercles were found at and near the root of the iris with marked frequency, contrary to the former opinion that this location is more typical for syphilitic nodules than for tubercles. In the syphilitic nodule the iris tissue itself is of normal thickness and the nodules fade away in the surrounding tissue. They consist of mononuclear cells embedded in a fine reticulum; giant cells may be present, but caseation is rare. Within the nodules are widely dilated capillaries. Tubercles, on the other hand, are avascular.

In four cases the author found good evidence in one, and very suggestive evidence in the other three, that the iris lesion was secondary to pre-existing tuberculous foci elsewhere in the body. These findings coincide with the views held by Leber, Fuchs, and de Wecker. Parinaud, Lawford, Bach, and others, however, are equally positive that the iris itself is the initial source of infection.

All of Tooke's patients were females, and seven out of eight cases reported by Stock were those of women past middle age.

The author gives a résumé of the work of Stock and Verhoeff on tuberculous iritis and quotes Stock's conclusions from his experimental work on rabbits in substance as follows:

The first manifestation is a general thickening of the iris tissue without any unusual thickening of the blood-vessels. Three or four days later small grayish masses appear in the iris tissue. Stock supports the author's contention that there is no such thing as a site of predilection for the tubercle of the iris. The nodules on healing leave a white spot. In some animals there was a generalized hyperæmia of the iris, with the formation of new vessels and the general appearance of granulation tissue. The infiltration may be so intense that solitary nodules cannot be detected. Later changes may appear in the surrounding tissues as parenchymatous keratitis. The nodules are more numerous on the posterior than on the anterior surface of the iris. Giant cells are to be found only when the process has been active for months, and tubercle bacilli only when there is central caseation of the individual tubercles.

In the more malignant form, when a parenchymatous keratitis ensued, the iris was generally studded with tubercles the center of which was generally necrotic. In two of the author's cases, especially, a distinct disturbance of the endothelial cells of the cornea was noted in the presence of a keratitis punctata. In the animals inoculated, as well as in the human cases recorded by Stock, Descemet's membrane always remained intact. In



one of the author's cases there was a fairly distinct atrophy or actual necrosis of this membrane.

In the author's experience an infiltration of the cornea is the rule rather than the exception. The ciliary body is not of necessity always acutely involved in the disease process. In gross involvement of the iris there may be large or small tubercles of the ciliary body. Stock was unable to find the pathologic manifestations in animals which might be expected from clinical observations in man.

Verhoeff states that in his experimental cases the size and number of the lesions were greater at the filtration angle than elsewhere, showing that more bacilli lodged in that area. In the author's cases and those of Stock also there was a prevalence of tubercles of the iris close to the filtration angle. The author notes further that in his cases the corneal lesion has been more often central than peripheral, a fact which he considers due largely to the more stagnant supply of lymph in the central area and perhaps secondarily to interference with nutrition from the aqueous by deposits in the pupillary area.

The author has shown that the extension of these lesions is through the blood-stream, thus accounting for the presence in tuberculous iridokeratitis of tubercles free in the vitreous, about the ciliary processes, in the choroid, and even in the more anterior portion of the retina. He regards the necrosis of Descemet's membrane in one of his cases as due not to direct apposition of the tubercle upon its endothelial lining, but to a deep interstitial keratitis with subsequent necrosis and doubtless with the presence of actual bacilli rather than toxins.

W. F. MONCREIFF.

## EAR

**Hill, F. T.:** A Study of the Aural Complications of the Recent Influenza Epidemic with Special Reference to the Clinical Picture. *Laryngoscope*, 1919, xxix, 351.

In the author's experience during the recent influenza epidemic otitis media was an infrequent complication of influenza and occurred more often in cases developing pneumonia. This type of otitis media first shows a hyperæmia and then an acute hyperplasia or hyperplastic œdema of the mucous membrane of the middle ear. The picture is definite and characteristic, including a drooping of the canal wall which is not indicative of a suppurative mastoiditis.

The operative indications of suppurative mastoiditis are increased purulent discharge and thickened mastoid periosteum. Mastoid tenderness and œdema, if present, are added arguments for surgical treatment.

S. S. HOWE.

**Lake, R.:** A New Method of Incision of the Tympanic Membrane for Acute Otitis. *Lancet*, 1919, cxcvi, 977.

The author advocates a curved incision with the convexity upward and following the contour of the edge of the ear-drum. He states that he has used this method for several years and that it has given him better results than any other, providing a general anæsthetic is employed and the case is seen before involvement of the antrum or mastoid cells. In his opinion it allows a longer drainage. For the after-treatment which he states is of considerable importance he recommends a combination of equal parts of hydrogen peroxide and chlorinated soda solution mixed immediately before use and syringed into the external meatus while it is effervescent.

D. C. BALFOUR.

**Alexander, C. J.:** A Case of Probable Metastatic Carcinoma of the Middle Ear. *J. Am. Inst. Homœop.*, 1919, xi, 1404.

The patient had had her right breast removed three years previously because of carcinoma. According to the subsequent history, throat and laryngeal symptoms, cough, a choking sensation, aphonia, and difficulty in swallowing were the first to manifest themselves afterward and therefore the condition in the middle ear must have been an extension from the throat.

A growth was found in the right side of the pharynx and there was complete immobility of the right vocal cord. The right drum was immovable by compression and aspiration, excepting a small area in the anterior and posterior superior quadrants. The lower half of the drum membrane was of a bluish-red color as if blood were behind but not against it. In the posterior superior quadrant were three small vertical folds and there was fixation of the malleus. Pronounced well-formed blood-vessels were seen extending from the roof of the external canal down over the drum membrane in front of and behind the short process of the malleus. Many were observed also extending outward from the drum membrane in all directions, but especially marked on the floor and posterior wall of the external canal. There were no clinical signs of labyrinthine involvement.

O. M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Hitschler, W. A.:** *The Technique of Nasal Douching.* *Pennsylvania, M. J.*, 1919, xxii, 551.

After discussing the prevalence of the habit of nasal douching and drawing attention to its dangers, Hitschler states the physical principles underlying a safe and efficient technique:

1. There should be sufficient space for the outflow of the liquid.
2. This can be determined only by means of the head mirror and reflected light.
3. If necessary, the mucosa should be shrunk first.
4. The mouth should be kept open.
5. The capacity of any apparatus should not exceed 4 to 6 drams.
6. Douching should be followed by an oily spray.

Technique of anterior douching: In using a rubber bulb, the patient's head should be held forward and downward and the mouth should be open. If one fossa is appreciably narrower than the other, the fluid should be introduced into the narrower nostril only.

Technique of posterior douching: With the patient's head erect, the right angled tip is introduced behind the soft palate and the fluid gently injected into the nasopharynx. The head should then be bent forward and downward immediately so as to permit the solution to flow out of the nose.

The solution used should be slightly acid.

O. M. ROTT.

**Lewis, J. D.:** *Head Complications of Influenza.* *J.-Lancet*, 1919, xxxix, 287.

During the influenza epidemic in Minneapolis many patients complained of symptoms resembling those due to sinus involvement but caused by mechanical interference with drainage from the sinuses. True empyema of the nasal accessory sinuses was the exception.

In 53 necropsies at Fort Riley, Kansas, sphenoiditis was found in 28, ethmoiditis in 13, and frontal sinusitis in 2. The predominating organism was the hæmolytic streptococcus. The writer therefore concludes that sinus involvement is more frequent in some localities than in others. E. J. PATTERSON.

## THROAT

**New, G. B.:** *Amyloid Tumors of the Upper Air Passages.* *Laryngoscope*, 1919, xxix, 327.

Amyloid tumors of the upper air passages are rare and occur as part of a general amyloidosis or as a local condition. The writer reports four cases of involvement of the larynx in which the tumor tissues had the appearance of yellowish waxy growths and the diagnoses were made by examination of excised portions.

In one case thyrotomy was necessary to relieve dyspnoea, and in another portions of the tumor were removed by the indirect method.

The X-ray, radium, and fulguration were used successfully in the treatment of these cases.

S. S. HOWE.

## MOUTH

**Talbot, E. S.:** *Bone Absorption around the Roots of Teeth.* *Dental Cosmos*, 1919, lxi, 361.

As a result of his research on bone absorption around the roots of teeth, the author reports that dental X-ray pictures do not show the pathology necessary for guidance in the treatment of interstitial gingivitis, pyorrhœa alveolaris, or apical alveolar changes. He finds that there are a number of stages in the pathologic evolution from the normal healthy tissues to a fully formed abscess which the X-ray does not and cannot, by the present method, show.

To treat diseased teeth and the alveolar tissues successfully, we must be able in some way to distinguish the finer changes which occur in the evolution of a fully developed abscess. Each stage requires different treatment, and a knowledge of each is necessary to decide whether a tooth can be saved or should be removed.

The removal of pulpless teeth is recommended when all other sources of infection have been excluded. By extracting such teeth, which did not show defects in the X-ray picture, the author has been able to arrest arthritis deformans and cure headaches, indigestion, boils, skin eruptions, and enlarged glands of the neck. M. N. FEDERSPIEL.



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# INTERNATIONAL ABSTRACT OF SURGERY

NOVEMBER, 1919

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Gurd, F. B.: The Application of Rutherford Morison's Technique of Wound Treatment to Civil Surgery. *Canadian M. Ass. J.*, 1919, ix, 625.

The essentials of the Rutherford Morison technique are:

1. Exposure: (a) incision, (b) excision.
2. Mechanical cleansing: (a) excision, (b) curettage, and (c) scrubbing.
3. The application of antiseptics: (a) alcohol, (b) "bipp."
4. Suture: either immediately or after the lapse of several days in which the wound is packed with "bipp" and paraffin gauze.
5. Infrequent dressings, i.e., every five to ten days.

"Bipp" is prepared as follows: bismuth subnitrate 1 part, iodoform, 2 parts, and liquid paraffin about 1 part. The ingredients are thoroughly mixed to form a thick paste.

According to the author, the use of "bipp" has been extremely successful in the treatment of war wounds and therefore ought to be useful in badly infected cases in civil surgery.

A large carbuncle at the back of the neck yielded nicely to this form of treatment and only two dressings were necessary. Primary union had resulted at the end of nineteen days. Several other cases in which good results were obtained are also cited. Two cases exhibited symptoms of poisoning characterized by stomatitis, bronzing of the skin, nausea, and vomiting, but the recovery was uninterrupted.

If the technique is carefully carried out and the surface to be "bipped" is not larger than a foot square, the danger of poisoning is extremely slight.

The advantages of the method consist of the absence of the clinical signs of inflammation, relative freedom from pain during the dressings, and the small number of dressings and small amount of dressing material required.

R. B. BETTMAN.

Polak, J. O.: The Relation of Pulse Pressure and Kidney Function to Operative Prognosis. *Am. J. Surg.*, 1919, xxxiii, Anæst. Supp., 82.

At the Long Island College Hospital Polak investigated the clinical value of pre-operative pulse pressure and its relation to kidney function in the operative prognosis of gynecological patients. On admission the cardiac force of each patient was studied in the following manner:

The systolic and diastolic pressures were taken with the patient in the recumbent position, and the pulse pressure noted at rest. The patient was then seated on a stool and instructed to raise the arms and extend and flex the forearm for two minutes, when the systolic and diastolic pressures were again taken and the pulse pressure noted and recorded as after moderate exercise. Finally the patient was made to stand up with the legs spread apart and a pound weight lying between her feet. This weight she was directed to raise over her head, then lower between the legs, and then raise it again. At first this was repeated ten times and then twenty times. The rate of the heart action is, of course, accelerated and the systolic pressure raised, but if the heart muscle is of good quality little or no change is noted in the pulse pressure.

The test described is of value in estimating the quality of the cardiac muscle, especially in women who have been ill with infectious diseases for a long time.

In order to estimate the renal function the sulphophenolphthalein output was also estimated. The author found that on averaging the normal pulse pressure at 35 millimeters, the phthalein output for two hours in the normal case averages about 60 per cent. When the pulse pressure is high, say 60 or 70 millimeters, the phthalein reading will be either high or low, depending on the state of the kidney structures. When the reading is low, the pulse pressure has to be relatively high to compensate for the diminished renal function.



On the other hand, when the phthalein reading is low, say 20 or 30 per cent in two hours, and the pulse pressure is also low, the patient is a poor operative risk and the condition of the cardiac muscle is always questionable. The one fatal case of postoperative cardiac dilatation showed a pre-operative pulse pressure of 24 and a phthalein output of only 29 per cent.

From a study of over 200 consecutive abdominal cases Polak concludes:

1. That the pulse pressure is a test of the muscular strength of the individual heart when endocardial lesions can be excluded.

2. That the efficiency of the kidney function is directly dependent upon the cardiac force of the patient, provided the kidney structures are normal or approximate the normal.

3. That ether anaesthesia of an hour does not disturb the relation of pulse pressure and kidney function unless the operation is accompanied by considerable loss of blood.

4. That when the pre-operative kidney function is low the pulse pressure must be relatively high to compensate for the deficiency, as it is of no value to add saline by skin or bowel or infusion unless there is sufficient cardiac strength to take it up and carry it along.

5. That when both the pulse pressure and phthalein output are low the operative prognosis should be guarded.

6. That morphine in large doses during operation seems to help in diminishing the shock but has a definite effect in diminishing the kidney output.

I. C. HERB.

**Bonnefon: The Biological Conception of the Surgical Operation; Will the Transplantation of Certain Diseased Tissues Determine Their Regeneration?** (Du concept biologique à l'acte chirurgical; la transplantation de certains tissus morbides, peut-elle déterminer leur régénérescence?) *J. de méd. de Bordeaux*, 1919, xc, 218.

In the transplantation of tissues Bonnefon believes that biological and surgical problems are intimately associated in determining either success or failure. The vital qualities and power of grafted tissue are important factors in assuring and directing the surgical procedures.

Much experimental and clinical evidence has led to the formulation of certain general laws with regard to transplants, i.e.:

1. That assimilable graft tissue is regularly assimilated by the tissue into which it is implanted.

2. That a healthy assimilable graft transplanted into pathologic tissue becomes itself pathologic or regenerates pathologically.

3. That an assimilable graft in process of degeneration or pathologic in character may lose this character when transplanted into healthy tissue.

A clinical exposition of these facts is given by an operation devised in 1913 by Morax on the opaque cornea. Discs cut with the trephine from

the opaque cornea and the transparent periphery are transposed. The transparent disc becomes invaded by the pathologic abnormal tissue in which it is implanted and itself becomes opaque, while the pathologic graft implanted in sound tissue in time becomes normal and transparent. The ultimate condition of the graft is thus determined by the character of the tissue into which it is implanted. The cellular elements of the grafted tissue die and are replaced by non-cellular tissue derived from the new environment. In a plastic operation, therefore, the prospects are not very encouraging unless the pathologic tissue is completely cut away from the site into which a graft is to be implanted. When a graft is surrounded by normal tissue it may be expected to "take" normally.

These theoretical considerations have been applied by Bonnefon to the treatment of pterygium. From the biological law it is evident that a pathologic tissue excised and re-implanted might regenerate normally if its anatomic environment were changed. Following the operative processes in general use, an excised pterygium was found to recur again and again, but in two cases in which the author operated experimentally on the basis of the biologic law his success went beyond what he had hoped for. In these cases the pterygium was entirely excised far into the sound tissue. After hæmostasis was effected it was re-implanted in its old bed but its position reversed so that the head which had been adherent to the cornea was sutured toward the inner angle and the base fitted to the corneal limbus. After twenty-four hours the morphologic characteristics of the pterygium were entirely changed. The vascular network was destroyed and replaced. On the following day the aspect of the graft was that of an irregular rectangle, cherry-red in color and slightly œdematous. After two or three weeks it was impossible to detect any trace of the former pterygium and the aspect was merely that of an ordinary autoplasmic graft.

Bonnefon believes that experimental work of this character should interest surgeons as it precisely confirms the biological laws reduced from extensive research work carried on by himself and others which govern the transplantation of tissue. The result obtained in the case reported is macroscopic proof of a fact which in other cases can be determined only by microscopic examination.

W. A. BRENNAN.

**LeConte, R. G.: The Delayed or Late Extraction of Intrathoracic Projectiles by the Method of Petit de la Villéon.** *Ann. Surg.*, 1919, lxx, 37.

This method depends upon the localization of the projectile with regard to its anatomical surroundings in contradistinction to its mathematical situation from surface markings. The foreign body is then removed by sight with forceps through a small buttonhole opening under the control of the X-rays and a fluoroscopic screen. The anatomical localization is discussed as regards seven different regions



and the dangerous and not dangerous areas of the lung. The technique of the operation is described and also the method of correlating the shadows of the tip of the forceps and the projectile by rotation of the operating table on its long axis. Three essentials are necessary for the successful practice of the method:

1. The acquisition of the radioscopic eye.
2. The intuitive correlation of the two shadows made by the foreign body and the point of the forceps.

3. Gentleness and dexterity of the hand.

The principle underlying the success of the method depends upon the fact that a closed forceps can be made to traverse a healthy lung without injuring the vessels or bronchi. The danger from hæmorrhage will come during extraction, when the blades of the forceps do not protect the surrounding tissues from cutting edges of the projectile.

The author discusses also the incidents which may occur during extraction, such as hæmoptysis, pneumothorax, hæmothorax, etc., the after-care of the patient, the dangerous zones from which projectiles should not be removed by this method, and the question of removing foreign bodies from the hilum of the lung. Data are given of 422 extractions with a mortality of a little less than 1 per cent, and the statistics of 92 extractions done by Robin. The indications for operation are summarized.

**Vaccarezza, R. F.: Jejunal and Gastrocolic Fistulæ Due to Peptic Ulcer Following Gastro-Enterostomy** (Fistulas yeyuno y gastroclicas por úlcera péptica consecutiva a la gastro enterostomia). *An. d. Inst. mod. de clin. med.*, Buenos Aires, 1919, iii, 264.

Vaccarezza says that the statistics collected by Van Roojen (up to 1919) show that 89 per cent of jejunal ulcers developing after a gastro-enterostomy perforate into the abdominal cavity or into the intestine. The proportion ought not be so high and the author believes it will be reduced when the means of arriving at an early diagnosis are improved.

In all cases of peptic ulcer opening into the colon the gastro-enterostomy was of the posterior type. In an anterior gastro-enterostomy the jejunum is fixed to the abdominal wall and upon opening exteriorly gives rise to a jejunal fistula. Of 29 cases of peritonitis due to this cause which were collected by Lion and Morea the gastro-enterostomy was anterior in 24 and of the Roux type in 4. In 1 its character was not stated.

The prophylactic treatment of gastro- or jejuno-colic fistula is that of the peptic ulcer which caused it. According to the author, the gastro-enterostomy of choice is the posterior transmesocolic operation of von Hacker. The Roux gastro-enterostomy favors ulcer, this predisposition evidently resulting from the distance between the duodenum and the anastomosed portion of the stomach, as it is known

that the resistance of the jejunal mucosa to the action of the gastric juice decreases according to the distance of the jejunum from the first portion of the small intestine.

The Y gastro-enterostomy exposes a portion of the jejunum to contact with a chemical acid with the hope that it will be neutralized by the biliary and pancreatic secretions; it enormously increases the peptic action of the gastric juice. The neostomy ought to be large and placed near the pylorus. High openings are dangerous as the stomach contents increase in acidity toward the cardia. Adhesions about the anastomosis should be avoided as they check peristalsis, favor stasis, and increase the peptic action of the gastric juice.

The author favors the exclusive use of catgut sutures in the gastro-enterostomies as non-absorbable materials act as foreign bodies and help to diffuse the gastric juice in the neighboring tissues.

After operation the patient should be given suitable medical treatment. If in spite of all precautions symptoms of secondary ulcer occur, a strict dietetic and therapeutic régime should be instituted. If this fails, a second operation should be performed.

The treatment of gastro- or jejunocolic fistula is strictly surgical and consists in destroying the fistulous tract by separating the colon from its gastric and jejunal connections and suturing the resulting openings.

If necessary, the old gastro-enterostomy should be obliterated and a new one done. If there is stenosis of the transverse colon it should be treated by colocolostomy and resection of the strictured part, colosigmoidostomy, or ileosigmoidostomy.

The author reports one case of gastrocolic fistula which developed after a posterior gastro-enterostomy and a subsequent jejunal ulcer in a man 28 years of age. The jejunum was freed from its connection with the stomach and colon, the fistulous tract extirpated, and the stomach orifice closed by catgut sutures in three planes. A strictured portion of the colon was resected with the galvanocautery and the ends anastomosed side-to-side. A fresh anterior gastro-enterostomy was also done. The patient died of purulent generalized peritonitis four days after operation.

W. A. BRENNAN.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Dunne, J. S.: Notes on Surgical Work in a General Hospital, with Special Reference to Carrel-Dakin's Method of Treatment.** *J. Roy. Army Med. Corps*, Lond., 1919, xxxiii, 58.

This article is based upon notes made by the author during a period of seven and one-half months while acting as officer in command of a surgical division in a hospital at a port of embarkation.

During the period under review battle casualties were treated and 481 operations were performed under general anæsthesia.



The condition of the wounds as they arrived at this hospital and the methods by which they had been treated were noted.

1. A number admitted from a casualty clearing station had been treated with flavine and Z paste and had been kept by that station for a period of from six to ten days. The results were exceptionally satisfactory. When the patient can be kept under observation and it is possible to perform an early and complete operation this, therefore, seems an ideal method.

2. Patients who had been treated with "bipp" paste did not arrive in the same satisfactory condition. Most of them were thoroughly septic.

3. Patients who had been treated by the salt pack method arrived bathed in foul smelling discharge. *Bacillus pyocyaneus* was a constant finding.

4. Patients treated by the Carrel-Dakin method arrived in good condition and if the complete operation had been performed and the technique strictly carried out, it was often difficult to realize that they were suffering from gangrenous wounds.

The success of the Carrel-Dakin method was obvious from the first. Secondary hæmorrhage disappeared practically completely in the cases under treatment. Moreover, the patients were cheerful and happy and dressings were not dreaded.

V. P. DIEDERICH.

### ANÆSTHETICS

**Reimann, S. P.:** The Acid-Base Regulatory Mechanism in Anæsthesia. *Am. J. Surg.*, 1919, xxxiii, Anæs. Supp., 86.

Reimann states that in 30 to 85 per cent of operative cases there is sufficient alkali in the body to neutralize the increased amount of acid substances formed as a result of anæsthesia, while in 15 to 20 per cent the body supply of alkali has been depleted to a point at which symptoms occur. Analytical data were secured mostly by estimates of the amount of bicarbonate in the blood plasma. In normal persons from 60 to 75 cubic centimeters of carbon dioxide are yielded per 100 cubic centimeters of plasma. This is derived practically entirely from bicarbonate. When there is an increased amount of acid, an equivalent increased amount of bicarbonate will be neutralized, and, of course, a smaller amount of carbon dioxide will be revealed by analysis. The reduction in the bicarbonate which has been found to occur after anæsthesia and operation averages from 5 to 15 cubic centimeters of carbon dioxide per 100 cubic centimeters of plasma. With the normal of from 60 to 75 cubic centimeters, this decrease in the large majority of cases does not reduce the carbon dioxide to below 50 cubic centimeters. The latter figure may be accepted as the lower limit of compensated acidosis, and above it no symptoms of acidosis will occur.

In 1908 Reicher found an increase in the amounts of ketone bodies, i.e., acetone, diacetic acid, and

$\beta$ -hydroxybutyric acid, in the urine after anæsthesia. This observation has been repeatedly confirmed by Reimann and others. Direct evidence that these ketones are increased in the blood after anæsthesia is afforded also by direct analyses. The author has computed that, on an average, 60 per cent of the observed fall in carbon dioxide of the plasma is accounted for, molecule for molecule, by these ketonic acids estimated as acetone. There is, therefore, definite evidence of an increase in the blood of at least one series of organic acids. Accordingly, the cause of a large part of the decrease in bicarbonate is demonstrated.

Ketones are well-known products of partial or incomplete oxidation. It has been repeatedly shown in experiments which need not be cited that oxidation is diminished during anæsthesia. It seems highly probable that other, as yet unidentified, acids of partial oxidation are also produced in excess. It is evident, therefore, that the sum total of these acids will determine the amount of alkali which will be withdrawn from the available quantity in the blood.

Since suboxidation is the important, if not the only, cause of the formation of acids during anæsthesia, the prevention of the formation of these acids must be directed toward the cause of the diminished oxidation. From these same experiments and others, it can be definitely stated that oxidation is diminished somewhere between the oxygen in the blood and the oxidizable substances in the cell. Further interference with oxidation is so intimately associated with the anæsthetic agent that to prevent suboxidation is to prevent anæsthesia. The protection of the patient against acidosis must therefore reside in supplying the body with alkali. Then when acids resulting from anæsthesia are formed, a sufficient amount of alkali will be available to neutralize them and compensate the acidosis.

Further studies have confirmed what has been demonstrated before, that the ammonia and titratable acidity of the urine are increased after anæsthesia. To put it briefly, these acids are neutralized by sodium bicarbonate and ammonia as they are formed, and later probably by other available but less easily mobilized bases such as calcium and magnesium. The salts of the acids are then excreted and thus eliminated from the body.

It can be said with safety that the symptoms which acidosis will produce of itself will vary according to the degree of the condition from mild headache and general mental dullness to coma and death. It cannot be stated dogmatically what symptoms were due to that condition in the 15 per cent of cases which showed acidosis, but it can be affirmed decisively that these patients suffered more nausea and vomiting, headache, and gas pains and took a longer time to recuperate than did the others in whom the acidosis was compensated.



Impaired kidney function, as would be expected, was a definite factor. In such cases there was not only the failure in the excretion of acid substances, but also the retention of other acids not resulting directly from the anæsthesia. Patients with diseases that drained the body of reserve alkali before operation, for example, severe, long-standing infectious processes and fever with its increased metabolism which caused excess acidity, always showed a marked diminution in carbon dioxide.

The interpretation that the reduction in plasma bicarbonate is due to over-ventilation of the lungs and not to acids was discussed for reasons which are clear. The decision between the two is fundamental. It has been recommended that carbon dioxide be given with the anæsthetic to make up from outside sources the carbon dioxide of inside metabolic origin which has been lost in excess through too rapid and too deep respiration. Suffice it to say that the acidity of the blood is a factor in maintaining the activity of the respiratory center. If the carbon dioxide of the blood is diminished through excessive ventilation and if the blood becomes more alkaline as a result, this normal stimulus would be diminished and the patient would stop breathing. It would then be logical to give carbon dioxide to keep the activity up to a given stimulating point. Since, however, other acids are formed in the body and in excess, this treatment is not only illogical but actually harmful. Under such circumstances and since carbon dioxide is an acid, insult would be heaped on injury by adding just so much more acid to that which has already been formed.

In conclusion it is recommended that estimation of the bicarbonate content of the plasma be made freely for the patient's comfort. When the pathology is grave and of long standing, when the operation is apt to be lengthy or serious, when there is, or is likely to be, a hæmorrhage, or when there is a possibility of shock, it is not only advisable for postoperative comfort, but imperative for the patient's safety that these estimations be made.

I. C. HERB.

**Long, W. H.: Vapor Anæsthesia for Oral and Facial Surgery.** *Am. J. Surg.*, 1919, xxxiii, Anæst. Supp., 77.

Long discusses the difficulties of maintaining a smooth, satisfactory, and uninterrupted anæsthesia for prolonged surgical work within the mouth or about the face and concludes it is for this reason that surgeons and anæsthetists have contented themselves with the unsatisfactory technique of an interrupted administration with its delays and its dangers.

The latter are at least two-fold for we know that an anæsthesia going from deep to shallow—an anæsthesia in which the procedure is a very profound induction, then withdrawal until the reflexes return, or even until voluntary muscular action is noted

(this may be repeated many times)—is more dangerous than a smooth and continuous maintenance of anæsthesia at a given depth. Moreover, as a proper aseptic technique cannot be adhered to under an interrupted or intermittently administered anæsthesia, the danger of infection is that much increased.

Int atracheal anæsthesia with the complicated apparatus necessary for its employment and the dangers incident to, and arising solely from, the method has never impressed the author favorably. A brief description of his own method he believes might be of interest and afford evidence that simplicity and lack of elaborate and complicated equipment are not incompatible with efficiency, although nothing new is claimed for the paraphernalia.

The Hitz bottle, which is merely an improved Junker, and the foot-bellows are all the apparatus needed save the various conductors, mouth-gag, nasal tubes, or cheek-hooks. The foot-bellows is cheaper, more portable, and as efficient as an electric motor blower. The anæsthetist soon learns to control the volume of air with the bellows, and the Hitz bottle is so made that any part on of the pumped air may be forced through the anæsthetic agent. This is its advantage over the original Junker. The bellows may be worked at the same speed and the same volume of air may be pumped, while the controller on the top of the bottle may be adjusted so that much or little anæsthetic vapor is conducted to the patient. At the "air" or inlet tube of the Hitz bottle is a Y made with a stopcock on one arm. A cylinder of oxygen is attached to this for emergency use or to augment the atmospheric air current from time to time if cyanosis or other indications for increased oxygenation are observed. The Junker apparatus is open to the theoretical objection that a constant vapor is not maintained.

The author advocates the use of a chloroform-ether mixture. Any method may be used for induction but the nitrous oxide-oxygen-ether sequence is preferred. For young children the essence of orange-ether sequence is best, but for maintenance a mixture of chloroform and ether is advised. The proportion in most cases is, roughly, chloroform one part and ether two parts, but this is varied according to the type of patient, and the chloroform is increased in the mixture when difficulty in maintenance is anticipated. Chloroform is a more powerful narcotizing agent than ether, and as the mouth cannot be covered to prevent the entrance of air, chloroform is the better agent for the method. However, re-inforcement with ether is essential for its stimulating effect, so that as a measure of safety the profound depression of chloroform alone may be counteracted.

Clinically and practically a mixture of chloroform and ether in which chloroform forms from one-third to one-half of the mixture gives a narcosis which acts like chloroform and has the appearance of an ether anæsthesia.

I. C. HERB.



**Sourdat, P.: Regional Anæsthesia in Gastric Surgery** (*L'anesthésie régionale en chirurgie gastrique*). *Presse méd.*, Par., 1919, xxvii, 193.

The author's method of inducing regional abdominal anæsthesia which was devised in 1914 consisted of infiltrating the spinal nerves at their emergence from the spine sufficiently near the spinal foramina to include the communicating branches of the sympathetic nerves. In this way the splanchnic nerves are blocked off and a sufficiently profound anæsthesia is obtained to permit operation upon the stomach, bile passages, etc. The seven last intercostals and the two first lumbar nerves on each side must be infiltrated.

It is admitted that the method is faulty as its results are not always the same and the number of nerves to be infiltrated makes it objectionable to the patient, especially when bilateral anæsthesia is essential.

To remedy the inconvenience Wendling has devised a method of anæsthetizing the splanchnic nerves at their emergence from the diaphragm and where they enter the solar plexus. Here the splanchnic nerves are embedded in loose cellular tissue at the sides of the abdominal aorta and then enter the insertions of the gastrohepatic and gastrophrenic folds. This region, the base of which is formed by the body of the twelfth dorsal vertebra, is bounded on the left by the cardia and the lesser curvature, beneath by the posterior cavity of the omentum and pancreas, and above by the left lobe of the liver. Injections made into the loose tissues enter the solar plexus and anæsthetize the splanchnic nerves.

The puncture is made about  $\frac{1}{2}$  centimeter to the left and 1 centimeter below the apex of the xiphoid on the transverse line joining the lower edges of the sixth ribs. A needle 9 centimeters long inserted perpendicularly through the skin, the left lobe of the liver, and the peritoneal cavity reaches just above the celiac trunk. From 50 to 80 cubic centimeters of a 1 per cent novocaine solution are injected. Usually the needle is not inserted more than 6 centimeters.

Although the penetration of the needle through the liver and close to the aorta appears somewhat dangerous, it will not be alarming to the experienced surgeon who is used to making deep punctures with a fine needle. Wendling admits that it has occasionally happened that arteries or veins were punctured, but the consequences were trivial; besides, there is the control afforded by the operation which opens the abdomen ten minutes after the puncture. In 27 cases operated upon by Wendling and anæsthetized according to this technique he found no effusion of blood in the peritoneum and no hæmorrhage from the punctured liver. Anæsthesia was obtained in 26 cases sufficient for gastrostomies, jejuno-stomies, biliary operations, and resections of the small intestine.

The splanchnic injection ought to be preceded by infiltration of the abdominal wall with a weak solution of novocaine. The postoperative results are very satisfactory.

W. A. BRENNAN.

**Stanley, L.: Spinal Anæsthesia in Upper Abdominal Surgery.** *California J. Med.*, 1919, xvii, 183.

During the past four years 600 operations have been performed at the California State Prison with the use of spinal anæsthesia. Of these, 68 were operations performed between the nipples and the umbilicus. The anæsthetic was tropacocaine solution.

As the specific gravity of tropacocaine solution is 1.027 and that of the cerebrospinal fluid only 1.007, the solution gravitates toward the head when the patient is placed in a Trendelenburg position. Sensation is then abolished as high as the nipples and sometimes even in the arms and hands.

The amount of tropacocaine used was  $\frac{1}{2}$  to 3 grains. Anæsthesia of the epigastrium occurred in four or five minutes after the injection. To save time, local anæsthesia may be used for opening the abdomen. Occasionally it was necessary to finish the operation with ether.

The average fall of blood-pressure was 28 millimeters. If the fall is alarming, 4 or 5 drops of adrenalin in salt solution may be given subcutaneously.

The advantages of spinal anæsthesia in operations upon the upper abdomen are that the anæsthesia is induced quickly, no anæsthetist is required, the abdominal walls are thoroughly relaxed, there is little shock as the spinal cord is temporarily blocked, there is seldom any vomiting, the lungs are not affected, and pneumonia does not follow.

H. J. VAN DEN BERG.

**Syms, P.: Sacral Anæsthesia: a Preliminary Report.** *Med. Rec.*, 1919, xcv, 991.

Syms states that by injecting about an ounce of fluid containing 6 grains of novocaine and 10 minims of a 50 per cent solution of calcium chloride into the sacral canal, complete anæsthesia of the parts supplied by the sacral nerves is produced. Surgical operations in the neighborhood of the perineum and around the anus may then be performed without the risk that attends local anæsthesia on the one hand and spinal anæsthesia on the other, and the patient is spared the discomforts and risks which accompany general anæsthesia.

Injecting into the sacral canal is not injecting into the spinal canal. The needle does not penetrate the dura and the fluid is therefore entirely epidural. The nerves lying in the sacral canal being bathed with the novocaine solution, this is a true instance of nerve blocking as distinguished from infiltration.

The method of injection is that described by Thompson. If the coccyx is movable, it will be quite easy to locate its upper end and in this way the lower end of the sacrum. If the two bones are ankylosed, it will not be so easy, but there is always an angle at the point of juncture. Usually the hiatus can be plainly palpated and recognized by the two prominent points which mark its sides.



The needle must be introduced in a direction parallel with and posterior to the canal the lower end of which is closed by a dense fibrous membrane. After the membrane is penetrated the needle should not be introduced much further. A distance of 3 or 4 centimeters is sufficient. Thompson has found that the lower end of the dura is on an average 5.8 centimeters from the hiatus; the shortest was 4 centimeters, the longest, 7 centimeters. The needle should be introduced detached from the syringe so that it may be determined whether its point has entered the spinal canal or a blood vessel. In either case the injection should not be made. If blood flows it will show that the needle is in a vessel,

probably a vein. If cerebrospinal fluid escapes, it has penetrated the dura. In either case it should be withdrawn sufficiently before the injection is begun. If the needle is properly within the canal, there will be no resistance to the flow of fluid. It will be as though the injection were being made into space. If the needle is not in the canal, but in the fascia outside the canal, resistance will be felt to the flow of the fluid. Before introducing the large needle the skin and superficial tissues must be anesthetized.

Anæsthesia should be complete in the region of the anus in twenty minutes and will last two or three hours.  
I. C. HERB.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Archibald, E.: A General Consideration of Wounds of the Head in the War.** *Med. Rec.*, 1919, xcvi, 16

In a general presentation of the subject the writer points out that, among other things, the war has brought a clearer conception of the effect of high velocity missiles, more accurate knowledge of symptomatology and the prognosis as to late results, and better operative procedures for the treatment of penetrating wounds.

In this war missiles fell roughly into three classes: pointed bullets, round shrapnel bullets, and fragments of high explosive shells. The lesions caused by them varied greatly according to the velocity at the moment of impact. A projectile of great velocity gives out force not only in the direct line of its path but also at right angles to that path.

The degrees of damage from maximum to minimum vary as follows:

1. Explosion, with the vertex fissured in all directions or blown off, scalp and dura widely torn open, and a large part of the brain disorganized.
2. Perforation, in which the entrance wound is usually small and the exit large. Bone fragments are frequently driven in.
3. Penetration only, the missile lodging in the brain.
4. Contusion or fracture of the external table, with or without fracture of the inner table. The dura may or may not be torn, and the brain may be considerably bruised, with or without cortical hæmorrhage.
5. Scalp alone injured, the bone intact, fissured, or slightly depressed. The brain may be superficially bruised.

Wounds made by perforation of the helmet were usually lacerating and superficial. The dura was rarely opened to any greater extent than the skull. As a rule the area of destruction of brain substance was decidedly wider than the actual track of the projectile. Free bleeding in the brain tissue was rare.

Infection of the brain, while frequent, was less common than would be expected. Most of the deaths which occurred at the Base after the second week were due to spreading infective encephalitis. Death due to cortical meningitis extending from the wound of entry was rare. Quite a large proportion of cerebral wounds examined bacteriologically proved to be sterile.

The early symptoms of concussion seemed physiologically to be the result of a hyperacute anæmia of the cortex and the vital centers in the medulla. Wounds of the head should not be operated upon when the blood-pressure is below 100, the breathing is shallow, and the pulse weak or fast. The average penetrating or even perforating head wound was not followed by any serious degree of general brain compression, though mild compression was common. The prognosis in cases of penetrating and perforating wounds was worse. Symptoms of general compression usually disappeared in three or four days, though in some instances unconsciousness lasted much longer. Later symptoms usually depended upon infection.

The study of local injury or compression has enriched neurology. A noteworthy example is the longitudinal-sinus syndrome described by Holmes and Sargent.

Lumbar puncture was of value in the diagnosis of subdural bleeding and of meningitis, as well as therapeutically in the latter condition. In acute cases there is danger in withdrawing more than a very few cubic centimeters of spinal fluid for the relief of serious compression, though careful withdrawal of a small amount may give at least temporary benefit. In later stages lumbar puncture was undoubtedly beneficial, especially for the relief of headache.

Scalp wounds should be excised. Wide excision and primary suture of all save the largest gave excellent results. The trephining of cranial wounds in which the dura was not penetrated was favored by most surgeons. If the dura appeared healthy, bone fragments were replaced and the excised



scalp wound was closed. If subdural hæmorrhage is suspected the author believes that the dura should not be opened except by an expert. When the dura has been penetrated the prognosis becomes worse and the treatment more difficult.

In scalp and bone wounds early removal of the whole wound track with foreign bodies, the introduction of an antiseptic, and primary suture of the scalp as performed in the last two years of the war gave good results, though it is not yet possible to judge accurately as to the relative merit of the open and closed methods of treatment.

The methods of Cushing and Willems are discussed. The writer is inclined to believe that Cushing's block removal of the wound in the bone is inadvisable, and that the bone edges may be rongueured away so as to leave the defect as small as possible.

According to the statistics of British and French writers, the late results have been better than was expected.

W. H. NADLER.

**Primrose, A.: Cranioplasty.** *Ann. Surg.*, 1919, lxx, 1.

The degree of disability resulting from the existence of a defect in the bony vault of the cranium varies within wide limits and is dependent upon a number of factors, including the size of the opening, the amount of scar tissue, and the damage sustained by the meninges of the brain as well as by the brain substance itself. There is also a certain psychic factor which has to be reckoned with in estimating the disability. The mental attitude of the wounded man may tend to give one an exaggerated conception of his trouble as indicated by the subjective symptoms or, in exceptional circumstances, the reverse may be the case.

The series of cases described in this paper consisted of 42 cranioplasties performed upon 36 patients.

**Age:** The youngest patient operated upon was 19 years of age, the oldest 40 years. The average age was 26.5 years.

The region of the cranium affected was as follows: frontal, 12; frontoparietal, 6; parietal, 15; occipitoparietal, 6; occipital, 2; and temporo-occipital, 1.

The wounds were all received while the patients were in active service, and most of them were due to bullets or shrapnel.

The time which elapsed between the reception of the wound and the cranioplasty varied from four to fifty months. The majority of the operations were performed within one year. The average time was fifteen and two-tenths months.

The symptoms varied in proportion to the extent of the wound and the region of the brain involved. For example, when the so-called "silent areas" of the brain were involved the symptoms were subjective in character, while in other cases there was evidence of an organic lesion such as hemiplegia, aphasia, defective vision, loss of hearing, loss of smell, etc.

The author made a careful analysis of the symptoms and the results obtained by successful cranio-

plasties in the whole series of 42 operations and records the results in detail.

**Headache:** All patients except 4 suffered from headache. The 4 free from this symptom had wounds in the parietal region and suffered from hemiplegia. As a rule the headache was relieved by the operation but there were 10 exceptions. In 4 of these it was only slightly relieved, in 5 it persisted as before, and in 1 it was worse after operation.

**Dizziness:** This distressing symptom was relieved in all instances except 2.

**Loss of memory:** The operation had no appreciable effect. Many patients with loss of memory showed progressive improvement before operation and the progress continued subsequently.

**Deafness, noises in the ears, defective vision:** These conditions were not affected by the operation.

**Aphasia:** There were 5 cases of aphasia in varying degree. Most of these showed progressive recovery which was not influenced by the operation.

**Hemiplegia:** Fifteen patients exhibited hemiplegia in varying degree. Some of them became hemiplegic immediately after receiving the wound but more frequently the condition developed some hours afterward. All showed a greater or less extent of progressive improvement subsequently, but the operation did not seem to have any effect upon the progress maintained. In one instance hemiplegia developed in association with Jacksonian seizures after a cartilage graft had been inserted but the paralysis entirely cleared up and the seizures ceased after removal of the graft, free dissection of the scar tissue, and the substitution of a fascial graft.

**Jacksonian epilepsy:** Six cases of Jacksonian epilepsy were operated upon. In all of these cases there was a history of hemiplegia and the gap was in the parietal region of the cranium. With one exception the epilepsy was relieved but the operation was performed too recently to warrant the assumption that the condition is permanently cured. The exception was that of a man who had a recurrence and died in a convulsion four months after the operation.

**Loss of the sense of smell:** One patient who had a double frontal gap no doubt suffered injury to the olfactory lobe of the brain at the time of the injury. The operation had no effect upon the resulting loss of the sense of smell.

**Dyspnœa:** In one case of hemiplegic and Jacksonian seizures there was also difficulty in breathing. The latter was not relieved by operation.

**Sense of fear, nervousness, and fear of being struck on the head; a feeling of insecurity:** Such sensations were very common. Closure of the gap in the cranium was most effective in allaying distressing symptoms of this type.

**Marked mental depression:** The operation was most beneficial in dissipating this condition.

**Character of the gap, size, pulsation, impulse on coughing, depression below the surrounding sur-**



face: The gaps varied in size from 3 centimeters in diameter to 9 by 12 centimeters. In most cases pulsation was observed except where the scar tissue immediately over the gap was very dense and firm. In nearly all instances there was impulse on coughing. A common and very characteristic feature was a bulging of the soft tissues covering the gap when the patient stooped over with his head between his knees. When the erect attitude was resumed the bulging was replaced by a depression. These conditions entirely disappeared after firm closure of the gap.

The scar: It became important to study the extent of the scar and remove it. Its firm adhesion to the dura mater often made dissection difficult. The scar should be removed as it frequently harbors infection and its vascularity is poor.

Nausea and vomiting: Mention is made of these symptoms because they were conspicuous by their absence, a fact which is perhaps not surprising because, in the cases under consideration, the intracranial pressure was probably diminished. Nausea was present in only one instance.

Restricted movement of the lower jaw: One patient had fixation of the jaw due to implication of the temporal muscle in scar tissue. This was relieved by dissection.

The type of graft employed was as follows: cartilage, 27 cases; bone, 13 cases; and fascia, 2 cases.

The cartilage grafts were all autogenous as were also the bone grafts, with one exception. The exception was that of a very large cranial defect which was closed by a graft from a human cadaver.

There were three cases in which it was necessary to remove a silver plate which had been inserted at another hospital. In each of these a cartilage graft was substituted successfully.

The technique of the operation: The technique employed was described previously by Wilson in the *Annals of Surgery* for March, 1919.

The cartilage graft: In the insertion of a cartilage graft the important point is to see that each piece of cartilage completely spans the gap and rests on a ledge of bone prepared for its reception at the edge of the gap. If an end of the cartilage lies free and unsupported in the gap, firmness will not be secured; there will be impulse on coughing and possibly pulsation.

The bone graft: Gaby has devised what is called the "bone-button graft." This is suitable when the gap is small, under 2 inches in diameter. The trephine is applied over the gap in the skull so as to cut 0.5 centimeter from the margin down to the diploë. The outer table is then chiseled off and a shelf of inner table thus left for the reception of the graft. A button of bone is then removed from the tibia by the use of the same trephine and transferred to the gap. With an Albee motor-saw fitted with a guard a rectangular gap may be closed with equal accuracy. A bone graft from a cadaver was used in the case of a patient who had a very large

cranial defect measuring 9 by 12 centimeters. The graft was prepared in such fashion as to encourage as far as possible the vascularization of the transplanted bone and its incorporation with the living tissues of the host. A piece of the parietal bone of suitable size was cut from the cranium of the cadaver. The inner table of the graft was reamed off so as to expose a diploic surface into which it was hoped blood-vessels might grow. The bone was then penetrated by numerous holes 3 millimeters in diameter and 6 millimeters apart. This converted it into a sieve and yet preserved sufficient firmness. The edges were beveled and made to fit accurately the ledge of inner table prepared for their support in the recipient's skull. When the graft was placed in position there was a large cavity between its concave surface and the dura mater below. This would obviously be a menace as it would lodge blood or serum and favor suppuration. Fortunately the patient was a stout man and it was possible to remove a flap of fascia lata, including a good thick pad of superficial fat, from his thigh. This plug of fat was turned toward the brain and the flap of fascia secured in place by a few catgut sutures. The patient made an excellent recovery and X-ray plates of the skull taken three and a half months after the operation show a gradual disappearance of the holes and the deposition of tissue of some density in their place. Four months after the operation the graft was absolutely firm and satisfactory.

The fascial graft: This is simply a graft of fascia lata which was used in 2 cases in which the use of bone or cartilage grafts was unsuccessful. The degree of firmness secured was of distinct advantage.

Mortality: There was no operative mortality in the series of 42 cases. One man died four months after the operation in convulsions.

Infection: It is remarkable that in such cases infection does not occur more frequently in view of the amount of scar tissue present and the history of previous infection of the wounds. In 2 cases material resembling bone dust was found near the margins of the gap. This material yielded a pure culture of staphylococcus but in both instances perfect closure of the wounds and a successful graft were obtained. It is obvious that the resistance of the tissues of the scalp and cranium to infection is much greater than that of the tissues about an infected bone in the extremities where, as is well known, plastic work invariably fails in the presence of infection. Infection of the wound occurred in only 5 cases of the series reported. In 2 of these the wound healed and the graft remained firm in spite of the infection. In 3 the graft was removed or sloughed out. Two of these grafts were of cartilage and 1 of bone.

The fate of the graft: In 1 instance it was necessary to remove a cartilage graft eight months after its insertion because it was not firm. This was the author's first case and the lack of firmness was due to faulty technique in that the pieces of



cartilage were not long enough to span the gap and obtain support upon the ledge of inner table. At operation the graft was found firmly united to the tissues in which it was embedded. It showed no gross evidence of atrophy and appeared to be normal cartilage. Histologically it was found that it had been invaded by blood-vessels from the surrounding fibrous tissue. There were some areas of deeper staining which were assumed to be deposits of calcareous material but as far as the examination went it seemed that the transplanted cartilage had not undergone any marked change and presented the normal appearance of hyaline cartilage. That changes occur in a bone graft was shown by the X-ray plates taken of a graft transferred from the cadaver. Three months and a half after the operation the holes were found to be disappearing and dense tissue was being deposited while the graft remained firm and solid to the touch.

The relief of symptoms by cranioplasty: A thoroughly satisfactory and firm graft was secured in 34 cases out of the 42. The bone graft and the cartilage graft seemed equally efficient. In 19 cases the symptoms were completely relieved by the operation, in 2 they were rendered worse, in 9 improved but not wholly relieved, and in 5 not changed.

The author summarizes his conclusion as follows:

It is possible to close a gap in the skull successfully by a graft of bone or cartilage and thus restore the integrity of the unyielding cranial vault. The operation is attended by little danger to life as shown by the absence of mortality in the series of cases reported. The relief of symptoms directly dependent upon the existence of the gap — such as headache, dizziness, the fear of injury, the sense of insecurity, and occasionally the worry and mental depression dependent upon the presence of an ugly deformity, particularly in the forehead — is as a rule immediate and complete. It is probable that when such a symptom as headache is not relieved, the trouble is dependent also upon some other condition. The gratitude expressed by men who are relieved of these comparatively simple but most distressing maladies and are rid of their deformity is sufficient guarantee that the operation is warranted.

The value of the operation in more complicated cases, more particularly cases of Jacksonian epilepsy, is less evident. Relief has been obtained in some instances but it is impossible to make a definite statement as to the probable permanence of the relief. The principle that all sources of cortical irritation should be removed if possible might speak in favor of the operation in such cases, but the graft itself may be a source of irritation as evidenced in 1 case of the series reported. In this instance a bone graft was removed and a fascial graft substituted with relief of the convulsions up to the present time, four months after the operation. In the majority of the cases of Jacksonian epilepsy some measure of relief was undoubtedly secured.

This would be explained by the relief of symptoms directly dependent upon the existence of the gap and the presence of scar tissue causing cortical irritation. Therefore the gap should be closed in these cases in order to eliminate the symptoms due to the existence of the defect and with the hope that in addition, the epileptic seizures may be ameliorated.

The effect of operation on such symptoms as defective vision, aphasia, loss of memory, deafness, and other symptoms dependent upon organic cerebral lesions is of little or no value.

The value of the fascial graft is well worth considering. When there is cortical irritation with much scar tissue implicating the dura mater, it is most serviceable to make a free dissection of the cicatricial tissue, remove the patch of dura mater involved and substitute a patch of fascia lata to close the rent.

**Frazier, C. H.: The Choice of Method in Operations upon the Pituitary Body. *Surg., Gynec. & Obst.*, 1919, xxix, 9.**

In its pathologic deviations the pituitary is not unlike the thyroid gland. As in the thyroid so in the pituitary the most common lesion is the adenoma, in both instances often with cystic developments. It is within the limits of a reasonable estimate to say that 75 per cent of pituitary tumors may be classified as adenomata.

The symptoms of pituitary disorders which must be reckoned with are: (1) those due to general intracranial pressure, such as headache; (2) those due to involvement of the optic chiasm and tract — the ocular phenomena; (3) those due to involvement of neighboring structures; and (4) those due to secretory derangement. In large measure the surgeon is asked to intervene for one of three conditions, either distressing headache, vomiting, or failing vision.

Of the methods of approach to the pituitary body time and experience have eliminated all but two — the submucous septal approach (Hirsch-Cushing) and the author's fronto-orbital method. Guided by the basic principles of (1) safety and practicability, (2) amplitude of exposure, and (3) end-results, the author analyzes the merits of these two methods.

The mortality of the submucous septal approach is 9 per cent, and of the fronto-orbital, 6.4 per cent. When the endonasal route is used meningitis must always be reckoned with and has been responsible for the majority of fatal cases. When the pituitary lesion is primarily and exclusively intrasellar and at the time of operation has not extended beyond its bounds, the lesion may be dealt with satisfactorily by the nasal approach; as a matter of fact, however, it is impossible in many instances to determine by roentgenograms or the symptoms how far the lesion has extended beyond the sella or whether it ever began there. A pituitary lesion entirely intrasellar is not sufficient to cause optic atrophy and certainly not the signs of increased intracranial tension; the presence of either of these bespeaks usually an



extrasellar extension and to the author's mind this should be recognized as a strong argument in favor of the frontal approach. Another factor is the condition of the sphenoid sinus. If the latter is shown by the roentgenogram to be largely or entirely obliterated the results of the intrasellar approach will be of short duration for in this case there is no opportunity for expansion of the lesion. Moreover, as about 19 per cent of adenomata develop cysts, mere evacuation by puncture is of only transitory benefit. Hence it is necessary to remove a portion of the cyst wall, and this can be done effectively only by the exposure afforded by the direct suprasellar approach. Another restriction to the endonasal method is met with in the undeveloped sinuses of children.

The author then describes modifications of his original operation which was reported in 1913. The essential difference is that in the original the approach to the sella was extradural, whereas now it is intradural. This facilitates elevation of the frontal lobe, affords a more satisfactory view of the sella region, and avoids the necessity of removing the roof of the orbit.

In conclusion Frazier states that the surgeon dealing with pituitary lesions should be familiar with both methods. As time goes on, however, he believes the fronto-orbital route will be found to have a wider field of application.

The steps of the operation are clearly illustrated by twelve cuts.

P. G. SKILLERN, JR.

**Lemaitre, F.: Exclusion of the Subarachnoid Spaces Applied to the Treatment of Abscesses of Otic Origin, and in General to Surgery of the Brain** (Exclusion des espaces sous-arachnoïdiens appliqué au traitement des abcès d'origine otique et, d'une façon générale, à la chirurgie d'encephale). *Presse méd.*, Par., 1919, xxvii, 312.

Lemaitre's paper was presented in May, 1919, at the eleventh French Congress of Otorhinolaryngology. His conclusions are summarized as follows:

1. Like all serosa the meninges defend themselves by the formation of adhesions. Such adhesions create a veritable spontaneous exclusion of the subarachnoid spaces in every sense comparable to the exclusion of the peritoneal cavity. Therefore the surgeon should respect them and in some instances re-inforce them.

2. When healthy, the meninges can be transformed at a selected point into a fibrous screen at will. The surgeon should create such a screen whenever he intends to approach the brain.

3. The provoked exclusion of the subarachnoid space may be effected by a simple, precise, and almost infallible technique. The advantages obtained from such exclusion are that meningitis and cranial hernia are avoided.

4. Meningeal exclusion finds its application in the treatment of cerebral or cerebellar collections whatever their origin. It may be applied also in other

cases of encephalic surgery such as the search for and extraction of foreign bodies.

5. In addition to its effect upon the prognosis of surgical affections of the brain, the exclusion of the subarachnoid spaces appears to be an important advance in the development of cerebral surgery.

W. A. BRENNAN.

**Lang, W.: Ivory Exostosis Growing from the Roof of the Frontal Sinus into the Orbital and Cranial Cavities, Removed Through an Osteoplastic Opening in the Cranium by Mr. Donald Armour.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Ophth., 16.

Lang and Armour report a case in which an ivory-like exostosis originating from the frontal sinus grew into the cranial and orbital cavities, displacing the left globe forward, downward, and outward, depressing the roof of the orbit, and producing diplopia but no other symptoms. The tumor was exposed by means of an osteoplastic flap with its base at the supra-orbital margin, the dura and frontal lobe being retracted, and the growth removed with chisel and cutting forceps. Complete recovery ensued.

W. F. MONCREIFF.

**Sebileau, P., and Caboche, H.: Anatomical Research in Regard to Total Rhinoplasty** (*Recherches anatomiques sur la rhinoplastie totale*). *Res. maxillo-faciale*, 1919, iii, 218.

An ideal total rhinoplasty requires the reproduction of the nasal bones, cartilages, and septum. This the authors endeavor to do by what they term the "three frontal grafts" process.

Three pieces of bone covered with periosteum are inserted beneath the frontal skin, the middle piece for a bridge and the two others to replace the nasal bones and the alar cartilage. The three grafts are arranged horizontally between the skin and the pericranium in such a way as to be enclosed by a horizontal skin flap with a vertical orbitonasal pedicle of the type used by Nélaton and Ombredanne.

When the re-inforced flap is cut out and twisted around its pedicle to an angle of 90 degrees and each of the two lateral grafts is reflected from the middle graft with the raw surface inside, a figure resembling the back of an open book is obtained. The two lateral grafts which simulate the covers of the book are intended to replace the nasal bones and alar cartilages and the middle graft, which simulates the back of the book, to form the bridge of the nose. A substitute for the nasal septum is then provided by bending the lower part of the median strip at about 20 millimeters from its end and turning it inward.

The authors tried this procedure on several cadavers with very satisfactory results. The complete technique is divided into 5 stages as follows: (1) preliminary measurements and preparation of a pattern of the nose, (2) cutting the grafts, (3) transplanting the grafts, (4) cutting out the bone and



skin flap, and (5) constructing and suturing the nasal pyramid and covering it with skin strips. The details of each stage are described.

The four points of contact with the skull—one above, below the glabellar region, made by the upper end of the bridge; one below, in the maxillary region, made by the septum; and two lateral, also in the maxillary region, made by the side pieces—guarantee a firm foundation. The æsthetic effect is good.

The authors have carried out this triple graft method in several cases, in two of which they have recently performed the final operation. The results remain to be seen but there are evidences already that they will be satisfactory. W. A. BRENNAN.

### NECK

**Church, A.: The Neurology of Cervical Ribs. *J. Am. M. Ass.*, 1919, lxxiii, 1.**

Since the introduction of the roentgen ray cervical ribs have often been discovered unexpectedly. Two investigators found 63 and 70 per cent respectively occurring in women. Cervical ribs are congenital but the clinical manifestations develop rarely under the tenth year of age and commonly between the tenth and thirtieth years. In a little more than half the cases they are bilateral. When only on one side, the left side is involved more frequently than the right. Occasionally they show hereditary tendencies.

The disturbance occasioned bears no relation to the size of the rib. Gruber classifies cervical ribs according to their size into four groups: (1) those consisting of only a node which does not extend beyond the lateral dimensions of the transverse process of the vertebra; (2) those which are merely blunt fingers of bone 4 or 5 centimeters in length; (3) those which extend far enough forward to articulate with the first rib or even to be attached to the sternum by a ligamentous cord; and (4) those which are complete ribs having a vertebral origin and costal cartilages.

Cervical ribs are commonly associated with other skeletal abnormalities, especially of the sternum, vertebrae, and ribs. The articulation of the cervical rib to the vertebra is a full synostosis or is partially osteal. Modifications of the scalene muscles are caused by the projection of this adventitious bony development, but the subclavian artery always curves above the rib or the fibrous cord which extends from its tip forward to the sternum and sometimes causes as much damage as a fully developed bone. The thorax is also changed to some extent in its conformation, its apex being higher.

The symptoms of cervical ribs appear after the first decade, due to the naturally increasing rigidity of the bony and cartilaginous structures, the reduction of arterial elasticity, and the increased weight thrown upon the upper extremity in the various activities of life. In some cases the arm disorders are occasioned by traumatism. Tuberculosis of the pulmonary apex may be found in association with

cervical ribs and at times a contiguous inflammation seems to have reached the brachial nerve trunks. Cases of periostitis of the supernumerary rib have been observed and occasionally the rib is the seat of a tumor growth. Nerves passing over the rib show an increased vulnerability under general systemic toxic conditions such as diphtheria and arthritis, and disorders in the peripheral distribution have followed subsequently. An arteriosclerosis of the subclavian may seriously affect the nerve structures as well as cause vascular faults.

The symptoms are not relative to the size of the structure. The early symptoms are merely local signs such as at times a tumor mass, a salient subclavian artery, general widening of the root of the neck, and a lofty lung apex.

A change of the character of the pulse on each side may be noted, and certain positions such as when the hand is raised above the head or drawn downward may stop the pulse or change its amplitude. At other times the pulse varies with the respiration, tending to disappear with full inspiration. Rarely there is a disturbance of the subclavian by rib pressure which produces thrombosis and loss of pulse. Other cases may show a subclavian aneurism at the point of going over the rib. The peripheral circulation is disturbed and at times has been mis-called Raynaud's disease. The fingers are often blue or reddened and œdematous. The hand on the affected side is more quickly influenced by cold and is colder. In the severe cases intense œdema, vasomotor flushing, and hyperhydrosis are frequently observed.

Nerve changes are the most common features and may be confined to the distribution of a single nerve or occur in the entire member. Neuralgic pains may extend to the back of the neck, the back of the shoulder, the region of the ear, the axillary line of the chest, or over the entire side of the body. Sensory disturbances are worst in the fingers, most commonly in the ulnar distribution. Paræsthesia, hyper- and hypo-sensitiveness of all grades may be found. There may even be dissociation of sensation. On the motor side weakness is usually pronounced but complete paralysis is rare. All varieties of claw hand may be found and often functional difficulties are present in the use of the hand, especially in the finer movements such as writing.

Disturbances of the trophic control in the small muscles of the arm and hand are very common. The muscles originating from the internal condyle are the group most frequently involved in the forearm. There may be changes in the skin, especially at the finger ends, such as trophic blebs, glossy skin, changes in the nails, and hæmorrhages under the nails. At times the sympathetic nerve has been involved, giving rise to pupillary disturbance, ptosis, and retraction or protrusion of the eye. The phrenic nerve may also be affected. Hoarseness has been reported in a number of cases.

Streissler found cervical scoliosis in 16 per cent of his cases. This deviation may be attended by more



or less asymmetry of the face and of the skull, and by compensatory curves in the dorsal region. At the same time there is a postural displacement of the shoulder and scapula.

The diagnosis is based on the symptoms and the X-ray findings but is often very difficult. The condition has been confused with tumors in the neck or upper dorsal vertebrae, aneurisms of the subclavian, Raynaud's disease, brachial neuritis, subacromial bursitis, and arthritis of the shoulder, pachymeningitis cervicalis, poliomyelitis, progressive atrophy, syringomyelia, intercostal neuralgias, cervical scoliosis, and pthisis.

The course of the condition extends over a long period of time, with intervals of comparative or complete freedom from symptoms. The latter come on insidiously and finally reach such a degree that heroic surgical intervention is readily accepted.

In the milder cases, conservative treatment, such as rest, avoidance of strain, and support of the arm, is advisable. At this stage electricity, massage, applications of heat and cold, and general measures may be employed. In the more pronounced grades of the condition recourse to surgery is the only means of cure. The extirpation of a cervical rib is one of the most difficult of major surgical operations because of the very precise anatomic dissection required and the fact that this dissection is done in a very dangerous locality. Incomplete removal of the rib may be followed by its regrowth with return of symptoms. It seems highly important that the periosteum should be completely removed. When complete extirpation can be effected the prospect for full relief and restitution of function is good, although some of the symptoms, such as chronic nerve, vascular, and trophic processes, require a long period of time and treatment for complete cure.

I. W. BACH.

**Hormaeche, D. G.: The Treatment of Primary and Secondary Thrombophlebitis of the Jugular by Grunert's Operation** (El tratamiento de las tromboflebitis primitivas o secundarias del golfo de la yugular por la operación de Grunert). *Rev. españ. de cirug.*, 1919, i, 310.

The thrombophlebitis which the author discusses can at times be diagnosed only during operation. Up to a few years ago such a diagnosis following acute or chronic otorrhoea was equivalent to a sentence of death. The number of operative recoveries, however, has increased as the operative technique has been improved and is especially large when the diagnosis is made and the operation performed early.

In this condition the thrombosed sinus should be opened. Contra-indications to operation are (1) extension of the thrombophlebitis to the superior lateral sinus; (2) extension to the sinus cavernosa; (3) poor general condition, comatose or cachectic; and (4) purulent meningitis.

Thrombosis of the jugular may be primary, as is

generally the case in acute otorrhoea, or secondary to thrombosis of the lateral sinus, as in chronic otorrhoea.

The treatment was not sufficiently radical until the adoption of Grunert's technique. The lavage method is rational and up to a certain point practical, but has dangers and is insufficient. Curettage is not devoid of danger and is illusory as it is too limited.

In comparison with these methods the drainage procedure as initiated by Alexander was a real step forward, but it did not suppress the focus of infection, and the danger of the extension of the phlebitis to the neighboring veins remained.

With the Grunert method and its perfecting modifications devised by Laurens and Lombardi the demands of modern surgery regarding infectious processes are satisfied for there is ample disinfection with drainage to the exterior of all the infected area.

W. A. BRENNAN.

**Beilby, G. E.: Acute Thyroiditis.** *N. York State J. M.*, 1919, xix, 274.

In a series of 91 operative thyroid cases the author had only 3 cases of acute suppurative thyroiditis. In 2 instances the condition was found in glands that were otherwise normal, and in 1, in a cystic adenoma.

Infection of the thyroid by the lymphatic route is rare because, although the thyroid is situated close to structures which frequently become infected, it has no direct lymphatic connection with them. Infection may occur by way of the blood stream, however, especially when there are degenerative changes in the gland as in cases of adenomata containing hæmorrhage.

The absence of the usual local signs of suppuration and inflammation in the early stages makes the diagnosis difficult and because of the pressure upon the trachea and œsophagus the cause of the trouble is usually sought first within the throat.

The pressure felt is due to the disposition of the thyroid capsule which splits at its posterior border, one leaf passing in front of the trachea and completely enveloping the gland and the other and thicker leaf passing to the dorsum of the pharynx and œsophagus. A sudden increase in volume within this capsule therefore causes compression.

The conclusions drawn are as follows:

1. Acute thyroiditis is relatively infrequent in both the normal gland and in pre-existing pathological conditions.

2. Particularly in the early stage the condition is apt to be unrecognized.

3. The diagnosis can be made more readily if the possibility of acute thyroiditis is borne in mind and is confirmed by the stone-like hardness of the gland.

4. Treatment by simple incision and puncture under local anæsthesia, avoiding all possible injury to the gland tissue, will give the best results.

K. L. VEHE.



## SURGERY OF THE CHEST

## CHEST WALL AND BREAST

Malone, A. E., and Wardrop, J. G.: **Recurrent Chylothorax Following Trauma.** *Lancet*, 1919, cxcvi, 1116.

The authors report the case of a French sailor who, ten days before coming under observation, had fallen a distance of 10 meters. His chief complaint on admission to the hospital was dyspnoea, and on examination a diagnosis of pleural effusion was made. Paracentesis was done, 200 ounces of milky fluid, slightly tinged with blood, being withdrawn. On the third day further aspiration was required, and re-accumulation of fluid then became so prompt that aspiration became necessary every other day. During the three weeks of observation a total quantity of 81 pints was removed. The fluid when examined on several occasions showed no evidence of tubercle bacilli.

Autopsy was negative as far as establishing any cause for the collection of chylous fluid, and no injury to the thoracic duct was found. Tuberculosis is occasionally responsible for chyloform effusion, but there was no evidence of tubercular lesions. The blood count was also negative. Milton has reported a case in which 15 pints of chylous fluid were withdrawn from the left pleural cavity at one time, with recovery of the patient. He attributed the effusion to tuberculosis of the thoracic duct.

D. C. BALFOUR.

Bernabeo, G.: **Artificial Pneumothorax and Thoracentesis in the Treatment of Hæmothorax** (Pneumotorace artificiale e toracentesi nella cura dell' emotorace). *Riforma med.*, 1919, xxxv, 310.

A more or less severe hæmothorax is a symptom in almost 90 per cent of thoracopulmonary wounds. Clinically there are 3 types of hæmothorax: (1) acute and generally fatal; (2) slow but progressively increasing; and (3) acute, non-fatal, and slow in development. The author, however, prefers to classify such cases into only 2 groups: the rapidly fatal acute and the acute non-fatal hæmothorax which is sometimes slow and sometimes rapid in development.

Surgeons are divided in their opinions with regard to the treatment. Some recommend a systematic active and radical treatment while others prefer to abstain from operation. Some adopt the so-called expectant treatment.

Morelli maintains that artificial pneumothorax practiced systematically is the ideal, both for prevention and treatment. As a preventive measure it favors cicatrization and encysting of a projectile which remains in the lung; as a curative measure it obviates harmful action of the blood upon the pleura and lung as well as the formation of adhesions. Every established hæmothorax requires thoracente-

sis and this operation ought to precede the pneumothorax. Morelli proposes the application to lung wounds of Forlanini's method of treating pulmonary phthisis by artificial pneumothorax.

Objections which have been made to Morelli's method are: (1) that it is impossible for the injected air to escape by the thoracic wall or lung; (2) that it affords the possibility for the formation of emboli; (3) that it would be better to utilize the presence of the blood to compress the lung; and (4) that there is a possibility of infection of the air. In Bernabeo's opinion only the last has any weight and to this Morelli replied by citing the large number of cases treated by pneumothorax without incident. Bernabeo, however, sustains this objection and says that even with the most scrupulous technique and the greatest scientific precautions with regard to sterilization, it is possible for bacteria to invade the pleural cavity. He reports certain cases in which the Morelli method was followed by empyema whereas other cases of hæmothorax not treated often evolve to recovery without the development of empyema.

From his own experience and the reports of others the author concludes that in closed thoracopulmonary wounds systematic intervention is not the wisest course and should be reserved for cases of progressive hæmothorax with dyspnoea and disturbing functional complications. Such cases he treats by thoracentesis followed by artificial pneumothorax and, when required, pleural lavage. For the thoracentesis and artificial pneumothorax he has devised a special type of apparatus which he illustrates and describes. It is so devised that it can be used also for pleural lavage when this is necessary owing to the presence of empyema. If after repeated lavage there is no improvement in the local and general symptoms he performs a thoracotomy, continuing the use of sera. Generally, however, the empyema is cured by lavage alone and a thoracotomy is required only when the thickness of the pleura is deeply involved and the pleural membranes are infiltrated.

In clinical practice it is best not to be guided by any pre-established system of treatment, but by the conditions of the particular case.

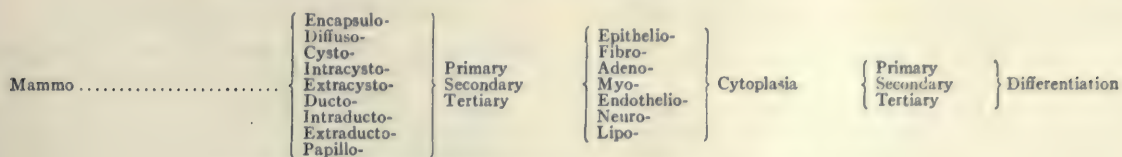
W. A. BRENNAN.

MacCarty, W. C., and Conner, H. M.: **Clinical Efficiency and Terminology in Cancer of the Breast.** *Surg., Gynec. & Obst.*, 1919, xxix, 44.

In dealing with cancer of the breast four persons are concerned, the one with the fewest facts being the patient and the one with the greatest number of facts being the pathologist. Intermediate are the clinician and the surgeon.

Since cancer of the breast begins as a microscopic condition for which no specific cure has been dis-





(MacCarty and Conner: *Clinical Efficiency and Terminology in Cancer of the Breast.*)

covered, it is of great importance long before it becomes possible for the patient, the clinician, the surgeon, or the pathologist to recognize its presence by any of the known methods.

To determine the relation of the pathologic facts to the terminology used in the clinical and pathologic diagnoses, two series of cases were studied. The first series (previously reported) represented the first 1,800 cases, and the second series, the last 300 cases, which have come under the authors' observation. A comparison of the diagnoses in the first series in tabular form is followed by a list of errors in the clinical diagnoses as revealed by the diagnoses made upon pathologic examination. Also for the same series the article contains a list of the terms used by the pathologist, and a more limited list of those used by the clinician.

To show the great variation in pathologic terminology several lists of pathologic terms have been copied from seven standard texts.

In the discussion of the clinical diagnosis the statement is made that there is nothing in clinical history which will differentiate a carcinoma 5 millimeters in diameter from an encapsulated fibroadenoma or a cyst of equal diameter.

In conclusion the authors state that the anatomical location of the biological reactions, their gross and microscopic structural manifestations, and their clinical behavior may be expressed briefly as in the table (see above).

This terminology deals only with tissue reactions coincident to regeneration of which neoplasia is but a phase. It does not attempt to express etiological factors. Neither is it expressive of the so-called inflammatory conditions, although in these the most important consideration from the patient's standpoint is the reaction of tissue regeneration.

Such a terminological key has served in the authors' laboratory of surgical pathology to indicate accurately, simply, and briefly the anatomical location, biological reactions, degree of biological reactions, and degrees of cellular differentiation. From it more accurate clinical data can be inferred, and inferred more easily, than from any terminology with which the authors are familiar.

C. R. STEINKE.

**Leyva, L., and Legendre: The Surgical Treatment and Prognosis of Empyema Following Lagrippe.**  
*Surg., Gynec. & Obst.*, 1919, xxix, 17.

The article reports the authors' experiences in the treatment of 27 cases of empyema following lagrippe. The mortality was 30 per cent.

The cases are grouped under two heads. The first class, the cases of white dyspnea, were those in which the respirations numbered from 25 to 30 per minute, depending on the amount of pleural pus. The organisms isolated were the staphylococcus, streptococcus, and pneumococcus. Operation relieved the dyspnea and reduced the temperature.

In the second class, the cases of blue dyspnea, the respirations numbered from 45 to 50 per minute and were not dependent upon the amount of pus which as a rule was not large. The organisms were the same as in Class 1 but operation did not relieve the dyspnea or temperature. Practically the entire mortality was in this class.

The prognosis is dependent upon the condition of the lung. Operation aggravates the general condition if both lungs are involved by previous disease. The patients cured were all operated upon after the subsidence of pulmonary symptoms. In the cases of those who died the operation was performed while the pulmonary disturbance was still present. The anæsthetic used in the latter instances was 2 per cent stovaine and the time of operation two or three minutes.

The particular type of organism present has no bearing on the indications for operation or the method used. The authors used the technique of Marion, Picquet, Legara, and Lemonant, resecting the ninth rib in sixteen cases and the eighth in three. The incision was made 1 inch below the scapular angle, prolonged backward as recommended by Walter and Pringle, and T-shaped. The drains were placed in the vertical branch. This incision, the authors believe, prevents the formation of fistulæ. Rib resection when permissible is absolutely essential.

Postoperatively the employment of Carrel-Dakin solution was not successful and its results could not be compared with those obtained with simple drainage. As a rule irrigation with this solution was followed by complications.

Chloroform is recommended as an anæsthetic. Also  $\frac{1}{4}$  grain of morphine before operation. Artificial serum and camphorated oil should be used for five to six days after the operation.

The authors summarize their conclusions as follows:

1. The prognosis in empyema is not based upon the nature of the organism but on the condition of the lungs.

2. As pleurisy starts early in grippe it is best, before resorting to surgery, to treat the condition



medically by aspiration and specific sera until the pulmonary symptoms have subsided.

3. The organism found has no bearing on the type of operation.

4. In pleurisy developing late in grippe the opening must be large and extended backward and rib resection is necessary.

5. Drainage without irrigation is the method of choice.

The article closes with detailed histories of the cases reported.

P. M. CHASE.

**Stone, W. J.: The Management of Postpneumonic Empyema Based upon 310 Cases.** *Am. J. M. Sc.*, 1919, clviii, 1.

Among approximately 4,000 cases of pneumonia, empyema developed in 310.

The series here reported include only the cases of patients who received treatment by aspiration or operation. Thirty-five were cured by repeated aspiration alone, while 275 came to operation. Not included in the series were those who died within a few days of admission after a diagnosis of empyema had been established or those who, because of the presence of an active pneumonia or serious complications, were not considered good risks and died during the course of aspirations for their relief.

The cases are grouped largely according to three time-intervals as follows:

1. First series: early operation (Oct. 20, 1917-Jan. 21, 1918), 85 cases. Mortality 61.2 per cent.

2. Second series: early aspiration and late operation, (Jan. 12, 1918-Aug. 10, 1918), 96 cases. Mortality 15.6 per cent.

3. Third series: early aspiration and late operation (Oct. 18, 1918-Feb. 14, 1919), 94 cases. Mortality 9.5 per cent.

In approximately 70 per cent of the patients the bacterium responsible was the streptococcus, which usually was of the hæmolytic variety.

The author gives abstracts of the findings in 48 autopsies as follows:

As complications, serofibrinous and purulent diffuse peritonitis occurred in 14 per cent. In 11 per cent the empyema was bilateral. Bilateral pneumonia was found in 15 per cent, lung abscess in 7 per cent, and pericarditis in 36 per cent.

In discussing the diagnosis of the presence of fluid he states that in many instances the physical signs were untrustworthy.

The surgical treatment consisted of drainage through a single large tube for forty-eight hours followed by the use of a Brewer tube connected with an Ewald suction bulb and a Carrel tube for irrigation and suction. The article includes illustrations of this apparatus. The operations consisted of both rib resection and intercostal drainage. No conclusions relative to the two methods were drawn.

The anæsthesia was both local and general. General anæsthesia proved reliable in cases in which there was no active pneumonia. V. P. DIEDERICH.

## HEART AND VASCULAR SYSTEM

**Rouviellois, H.: Bullet Embedded in the Wall of the Right Ventricle of the Heart Extracted by Median Thoracotomy; Recovery** (Plaie ancienne du cœur par balle de fusil incluse dans la paroi du ventricule droit. Extraction du projectile par thoraco-laparotomie médiane. Guérison). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 852.

The patient was shot in the left side of the chest in October, 1914. After being operated upon he returned to the front but was made a prisoner. He returned to France in November, 1918, in a very bad condition, evidently due to the retention of a bullet in the heart region which was quite evident from the radiologic examination.

Owing to the patient's general condition it was decided to operate for the removal of the body, which was judged to be in the pericardium, by the method of median thoracotomy recently described and practiced by Duval and Barnsby. The anæsthetic used was ether. The incision was begun at the lower edge of the third rib and extended to a point midway between the umbilicus and the xiphoid cartilage. The rectus muscles were separated and the diaphragmatic attachments cut through. The sternum was then sectioned vertically along the median line and a transverse incision made just below the third rib. The two sternal flaps were separated with a Tuffier retractor. The peritoneum and pericardium were opened and an incision made into the diaphragm.

After search, the projectile was located through the wall of the right ventricle of the heart near the apex. No lesion was apparent externally. To isolate the projectile a few catgut sutures were passed around it. Extraction was very difficult as, being embedded in the muscle, it had to be cut out.

After the extraction there was considerable hæmorrhage. The pulse was 112 and its pressure varied between 11 and 9. In spite of cardiac oppression, restricted respiration, and emphysema, however, the patient rallied after the first day. By the thirteenth day following operation his condition was excellent.

In discussing the case the author points to the functional and other disturbances which occurred late in spite of the excellent toleration of the foreign for four and a half years. The operation was justified by the subsequent cessation of these disturbances.

In the author's experience the thoracotomy method used has been very satisfactory. It is easy to follow and non-mutilating though it gives wide access to the pericardium.

While the pleural cul-de-sacs were being ripped with the finger behind the sternum a few bubbles of air mixed with blood appeared in the wound. The incident cannot be explained, but had no untoward result. The operation was followed by complete recovery.

W. A. BRENNAN.



## PHARYNX AND ŒSOPHAGUS

**Moorhead, E. L.:** Stricture of the Œsophagus; Discussion of Three Cases. *Surg. Clin. Chicago*, 1919, iii, 611.

Obstruction of the Œsophagus may be caused by foreign bodies within its lumen and their sequelæ, by inflammation due to tuberculosis, syphilis, thrush or diphtheria, by diphtheritic paralysis and hysterical paralysis, diverticula, polypoid or other benign growths, enlargement of the thyroid and lymphatic glands, aneurism of the aorta, and mediastinal tumors.

Organic stricture of the Œsophagus may be congenital or acquired. While the former is exceedingly rare, the latter is very common and may be either simple or malignant. The most common cause of simple stricture is the swallowing of corrosive fluids. Malignant stricture is usually carcinomatous.

The most common symptom of Œsophageal stricture is progressive difficulty in swallowing which results finally in total inability to swallow. Associated with this is increasing malnutrition, emaciation, and anæmia.

Involvement of the mediastinal structure may

result in hoarseness and aphonia if the recurrent laryngeals are involved, in disordered heart action if the vagus is involved, and in cough.

The diagnosis is confirmed by the X-ray examination with the bismuth meal. The Œsophagoscope will aid in the differential diagnosis. The bougie as a diagnostic instrument should be used with care because of the danger of puncturing malignant growths, causing hæmorrhage and mediastinitis.

Cicatricial strictures are treated by progressive dilatation. If the stricture is high it may be incised through the Œsophagoscope and subsequently dilated. If it is very tight a thread of silk may be passed by having the patient swallow a shot attached to its end, after which a gastrotomy should be done and the shot secured. A heavier silk may then be drawn back and used as a saw to sever the stricture. Strictures at the cardia may be dilated manually through a gastrotomy and subsequently by bougies.

Malignant strictures which produce total obstruction are best treated by gastrostomy. The author presents histories of two such cases.

K. L. VEHE.

## SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

**Niwase, N.:** The Position of the Navel of Man. *Am. J. Obst.*, 1919, lxxx, 49.

To determine the usual position of the navel the author examined 1,000 Japanese women, using principally a rolling centimeter measure. With the patient lying on her back he measured the distances from the upper anterior iliac spine to the upper end of the middle line of the symphysis pubis, from these two points to the lower margin of the navel, and from the upper margin of the navel to the lower end of the xiphoid process.

In 86.8 per cent of the cases the distance between the navel and iliac spine, the iliac spine and the symphysis pubis, the symphysis pubis and the navel were quite the same; in other words, the navel was situated at the vertex of a right triangle based on a line connecting the symphysis pubis and the upper anterior iliac spine. EDWARD L. CORNELL.

**Brooks, B.:** Umbilical Teratoma. *Ann. Surg.*, 1919, lxix, 603.

The patient was a male child, 2 years and 4 months old, who was admitted to the hospital for treatment of an ulceration and a persistent watery discharge from the umbilicus. Except for an attack of diarrhœa about six months previously, he had always been well. The ulceration about the umbilicus was first noticed when he was 1 year old. Since then it had never healed and the discharge had been continuous.

On examination it was found that the umbilicus

was replaced by an ulcer approximately 1 by 2 centimeters in size, the outline of which was that of a triangle with the base upward and the apex toward the symphysis pubis. The edge of the epithelium was serrated but always abrupt. The base of the ulcer was brownish-red in color and bled upon slight injury. Under its overhanging superior margin was a small sinus into which a probe could be passed for a distance of 3 centimeters.

At operation a spherical tumor approximately 2 centimeters in diameter and without any visible connection with other structures was found on the peritoneal surface of the umbilical region. As the operation was performed in the presence of a chronic ulceration an extensive exploration of the abdomen to determine the presence or absence of a Meckel's diverticulum was impossible. The tumor, sinus, and ulcer were excised in one piece. The wound was closed according to the technique used in closing an umbilical hernia except that a small drain was placed in the subcutaneous tissue. Following the operation there was a mild wound infection which healed slowly. The patient was discharged well.

Microscopical examination showed the spherical tumor to be composed of tissues corresponding to those of normal intestine. Peritoneum, muscle, nerve cells, submucosa, lymphoid nodules, and mucosa were all present in their usual relations. The mucosa corresponded in the character of the cells and the arrangement of the glands to the mucosa of the normal duodenum.

In the wall of the tumor adjacent to the perito-



neum was a small island of normal pancreas. The gland was lobulated. The arrangement of the acini and ducts was the same as that of the normal pancreas. The external opening of the main duct was found. In the pancreatic tissue were a large number of typically normal islands of Langerhans.

EDWARD L. CORNELL.

**Garrido-Lestache: Pseudopyloric Umbilical Fistulae** (Fistulas ciegas pseudopilóricas del ombligo). *Arch. españ. de enferm. d. aparat. digest.*, 1919, ii, 228.

The author has seen only 3 cases of this type of pseudopyloric umbilical fistulae in a children's hospital during a period of seven years. Such fistulae occur in very young infants. The umbilical region is seen to be moistened by a fluid which appears to proceed from its fundus and which causes ulceration of the skin. The fistular tract which is congenital in origin, generally shallow, and extra-peritoneal, has a small orifice which is difficult to sound. Chemical analyses show that the fluid from the fistula in every way resembles gastric juice. The fistulae are lined with a mucosa identical with the gastric mucosa.

Various theories have been advanced with regard to the origin of such fistulae, but in the author's opinion none of them is satisfactory. He himself believes they originate in the second month of embryonic life and are due to irregular development of the omphalomesenteric duct uniting the umbilicus to the intestine. This union of the omphalomesenteric duct to the intestine is effected very high, i.e., in the pyloric region. W. A. BRENNAN.

**Nigst, P. F.: Hernia Developing in the Scar after Appendectomy** (Zur Entstehung von Narbenhernien nach Appendektomie). *Cor.-Bl. f. Schweiz. Aerzte*, 1919, xlix, 353.

In a series of 127 appendectomies in which drainage was used a scar hernia developed in 14 cases within a few weeks or months after the laparotomy. Two of these followed a McBurney incision; 2, a pararectal incision; 8, an incision under Poupart's ligament; 1, an incision 10 centimeters long; and 1, an incision from the rectus to a point two finger-breadths above the anterior superior spine of the ilium. The time of drainage was prolonged in only three of these cases and varied from five to thirty-five days.

When the suturing is done carefully in an appendectomy performed in the afebrile period a hernia does not develop in the scar. Such a rupture is more apt to follow an encysted abscess or appendicular peritonitis which requires prolonged drainage. The sex, age, or constitutional condition of the patient do not seem to be of particular importance. The factors upon which the production of scar hernia depends are the nature of the incision and the quality of the suture. When the McBurney technique is used and the incision closed in layers close up to the drainage tube with absorbable suture

material the incidence of hernia seems to be less. Parallel incisions close to Poupart's ligament should be avoided. The McBurney incision preserves the integrity of the muscle as well as of the nerves and vessels in the abdominal wall to the maximum.

When the abdominal wall is sutured with non-absorbable suture material, and especially when drainage is prolonged, there is always danger of infection, even when care is taken to make the wound tight above the drain. W. A. BRENNAN.

**Hale, K.: Fatty Hernia.** *Ann. Surg.*, 1919, lxi, 278.

The author reports a very unusual case of strangulated fatty hernia occurring in the femoral region. There was no viscus in the hernial sac.

The diagnosis of a fatty hernia, although frequently not very difficult, is often not made because the condition is overlooked. These tumors are of slow progressive growth and occur without obvious cause. When pinched up between the fingers, they are lobulated and often dimpled on the surface. If lifted off the parts beneath, there is no impulse on coughing. They occur frequently in inguinal hernia in conjunction with a true sac, although they may have no peritoneal sac at all as in the epigastric hernia occurring in the linea alba or linea semilunaris. Rarely, as in the author's case, they may become strangulated, even with an empty sac. In some cases false reduction is possible.

The treatment is the same as that of an ordinary hernia in the same location. GATEWOOD.

**Giorgacopulo, D.: Innovations in the Bassini Operation for Inguinal Hernia** (Innovazioni all'operazione dell'ernia inguinale secondo Bassini). *Policlin.*, Roma, 1919, xxvi, sez. prat., 686.

The author refers to some minor alterations in the Bassini operation which were reported by German surgeons during the war. These innovations are aimed principally against the tendency to recurrence. Metallic sutures have been used, the internal oblique has been left intact, a new internal inguinal ring substituted, and transplants of fascia made at the entrance of the inguinal canal to strengthen the supposed weak spots.

In reviewing these procedures the author states that all who have made these changes have been unanimous in admitting that atrophy or weakness of the internal obliquus reduces the chances of obtaining a favorable result by the Bassini operation. There is no unanimity, however, in regard to the point where resistance fails, as the fault has been credited to both the internal and the external rings.

While admitting that theoretically the various innovations suggested are good, the author believes the unmodified Bassini technique is best for it has been found to give from 90 to 98 per cent of recoveries. The innovations suggested are unnecessary. After thirty years the Bassini operation remains today in his opinion the only radical method for the cure of inguinal hernia. W. A. BRENNAN.



**Lecène, P.: Strangulation of a Congenital Inguinal Hernia with Spontaneous Separation from the Mesentery** (Hernie inguinale congénitale étranglée avec désinsertion mésentérique spontanée). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 828.

Lecène's case was that of a soldier who had a congenital hernia and did not wear a truss. Severe pain in the left inguinal region was followed by vomiting. In the hospital no attempt was made to reduce the hernia by taxis. Operation was performed ten hours after admission. When the strangulation was released and the loop of intestine removed from the sac it was found that the bowel was separated from the mesentery for a distance of about 6 to 8 centimeters. A portion of the loop measuring about 60 centimeters was resected. The patient made an uneventful recovery.

The author states that this is the only case of spontaneous separation of the bowel from the mesentery that he has observed in very numerous herniotomies. Before this he had been somewhat skeptical in regard to the possibility of such an occurrence. The cases reported in the literature appeared rather exceptional and difficult to explain, especially when violent taxis had not been exerted upon the hernial sac. In his own case there was no attempt at taxis. The strangulation occurred very suddenly within a congenital sac with a very narrow neck and with multiple strictures following violent straining. These factors he believes are all of value in the production of spontaneous mesenteric separation and show that even in a young patient the complication may occur quite independently of traumatism due to taxis.

W. A. BRENNAN.

#### GASTRO-INTESTINAL TRACT

**Sappington, S. W.: Syphilis of the Stomach: a Review with Notes on a Case of Syphilitic Pyloric Stenosis.** *Hahneman. Month.*, 1919, liv, 357.

From notes on a case in which the clinical picture strongly suggested malignancy and the autopsy showed the presence of syphilitic pyloric stenosis the author draws the following conclusions:

1. Syphilis of the stomach is rare but not as uncommon as is generally believed.

2. The conception of the gastric lesion as a gross gumma is erroneous for the pathology involves a microscopic cellular infiltration, gross or focal, which in its ultimate development produces a clinical picture closely resembling that of other gastric diseases, especially cancer and peptic ulcer.

3. A positive Wassermann reaction, anacidity or achylia, and demonstrable lesions shown by the X-ray are sufficient evidence to justify the suspicion that the condition is a luetic infection of the stomach and should lead to a therapeutic test with antisyphilis drugs.

4. This test may confirm a tentative diagnosis by effecting remarkable improvement.

E. C. ROBITSHEK.

**Holmes, G.: Pedunculated Malignant Growths of the Stomach.** *Am. J. Roentgenol.*, 1919, vi, 279.

The author reports in detail three cases of polypoid tumors of the stomach with the clinical, X-ray, and operative findings.

The roentgen findings were practically identical in the three cases. A peculiar feature shown by all was rather marked encroachment of the growth into the lumen of the stomach and peristalsis passing over the stomach wall. No infiltration of the wall could be demonstrated either roentgenologically or at operation.

The passage of a peristaltic wave without a break over the area of defective filling is sufficient to differentiate the lesion from carcinoma.

W. A. EVANS.

**Gallart, F., and Ribas y Ribas: The Surgical Treatment of Gastric Ulcer** (Tratamiento quirúrgico de la úlcera gástrica). *Rev. españ. de cirug.*, 1919, i, 252.

The following are the conclusions drawn in this paper which was presented at the National Congress of Medicine held at Madrid in April, 1919:

1. Gastric ulcer may become cured either spontaneously or by medical treatment. The results of the curative process are cicatrices of the pylorus and the anterior wall of the stomach.

2. Factors which prevent cure are: pyloric spasm, hyperacidity, gastric stasis, the constant irritating contact of food with the ulcer, etc.

3. Every gastric ulcer which will not yield to medical treatment should be operated upon. If the patient is not able to give the time for continued medical treatment, operation should be done as soon as the ulcer is diagnosed.

4. When a gastro-enterostomy is performed it should always be associated with exclusion of the pylorus.

5. Resection of the ulcer alone is indicated in cases of small, single ulcers without adhesions or concomitant lesions of the gastric wall.

6. The authors' statistics show that only 8 per cent of cases of ulcer are in a good condition for operation. The other 92 per cent are cases of old ulcers with infiltration, extensive gastritis, and numerous adhesions. In 12 per cent of these there are multiple ulcers. In the majority of cases of complex ulcers resection, while technically possible, is risky. Even in simple cases of small, mobile ulcers the mortality of resection varies from 20 to 30 per cent.

7. Gastro-enterostomy is the operation of choice for gastric ulcer. This procedure is simple and, when well executed, provides an ample vertical opening in the lowest part of the pyloric antrum. The mortality of gastro-enterostomy varies from 3 to 4 per cent.

8. The authors' statistics show that the patients exhibiting gastric disturbances after gastro-enterostomy were those who, in addition to the ulcer, had irreparable glandular lesions of the gastric mucosa or connective tissue, or those who had ulcers



of the lesser curvature and posterior wall of the stomach with solid adhesions to the pancreas. In other cases the authors have never seen the recurrence of an ulcer.

9. The Alvarez operation is indicated in the painful types of ulcer with many adhesions, neuritis, etc.

W. A. BRENNAN.

**Doege, K.: A Plea for More Aggressiveness in the Treatment of Chronic Gastric Ulcer and Gastric Cancer.** *Wisconsin M. J.*, 1919, xviii, 49.

The author presents arguments in favor of greater aggressiveness in dealing with the complications of gastric ulcer such as stenosing scars, ulcus-tumors, adhesions, and gastric cancer.

Chronic gastric ulcer should be treated surgically only when internal medicine has failed and complications have arisen. Acute perforation and pyloric ulcer with stenosis, it is admitted by all medical men, can be treated only by means of surgery. Drainage and closure of the ulcer in the former and simple gastro-enterostomy in the latter are the accepted modes of procedure. However, gastro-enterostomy should not be considered the only desideratum and main-stay in all ulcer cases. Sometimes it is successful, but more often, after a period of relief the old symptoms of pain, hæmorrhage, and indigestion return. The marked tendency of the gastric contents to follow their former course through the pylorus still persists in spite of a large enterostomy opening. The recurrence of the former condition is due to the fact that, because of non-use, this opening gradually shrinks.

Excision of the ulcer may also be successful in a number of cases but if the ulcer is of any size this method may seriously interfere with the proper emptying of the stomach by shortening the lesser curvature and by drawing the pylorus nearer the cardia, forming a pouch-like stomach. This method should be used therefore only in conjunction with gastro-enterostomy.

Even the exclusion of the pylorus by ligation or complete division and suture is not absolutely perfect as in some instances the hæmorrhages have recurred. Moreover, the inability of the surgeon to obtain invariably by palpation a correct idea of the conditions within the stomach and of the proper course to follow in the individual case is indeed perplexing.

The Mayo Clinic has reported 68 per cent of cancers arising from or associated with ulcers, and Continental pathologists give 2 per cent. Ewing of Cornell, on the other hand, believes that it is much more probable that a cancer becomes ulcerous than that an ulcer becomes cancerous.

Of late, resection of the stomach has been the method of choice with many surgeons and the mortality of this procedure has been steadily declining with larger experience and improved technique until today it is only slightly more than that of simple gastro-enterostomy.

In cases of ulcus-tumor masses involving several

of the organs of the upper abdomen it is of great benefit to obtain plenty of room by free incision and to palpate the mass well before proceeding further. If the liver is involved the inflammatory process has replaced the cells by fibrous tissue so that incision and suturing will not provoke bleeding. Adhesions to the pancreas must be separated without much injury to that organ, and if an active pancreatic ulcer persists it must be curetted gently and touched with carbolic acid. If the colon is involved, it should be resected. In closing the abdomen no drainage is necessary.

Cancer cases constitute today one of the most fruitful surgical fields and a most favorable prognosis is offered by early surgical intervention. It is a well-known fact that a cancerous abdomen will withstand extensive operations surprisingly well even though the patient is cachectic and losing strength. The shock is much less than is usual in similar operations on the non-cancerous abdomen, possibly because a certain degree of immunity has been induced by the cancer and the abdominal stasis. When, however, there is metastasis, a nodular liver, or ascites, it is useless to operate. Severe cachexia should not necessarily prevent operation for when the sloughing cancer is removed it will disappear. Nor should the length of time the condition has existed interfere with surgical treatment for Boas has shown that even the scirrhus form has an exceptionally favorable prognosis. The decision as to operation should be made upon the extent of involvement of neighboring organs and the presence or absence of metastasis.

If the cancer is limited to the stomach and the mass can be delivered easily, resection is indicated. Very often lessened mobility depends upon involvement of the lymph glands and vessels along the upper and lower curvatures. With involvement of the colon resection of the area in one piece with the stomach, together with the lymph glands of the lesser and greater curvatures, may give excellent results. Considerable involvement of the pancreas is always a contra-indication to operation as fat necrosis usually follows excision of this organ. Cancer of the mesentery of the small bowel also contra-indicates operative procedure.

While in pyloric stenosis resection is the operation of choice, a gastro-enterostomy often affords great relief in otherwise inoperable cases.

P. M. CHASE.

**Gouget, A.: The Evolution of Gastric Cancer of Anasarcous Type** (*L'évolution du cancer de l'estomac à forme d'anasarque*). *Presse méd.*, Par., 1919, xxvii, 329.

Gouget finds the cases of true gastric cancer with anasarca which are reported in literature to be few in number. Including the case reported by him in this article he knows of only 13. These he divides into 3 classes. In the first class he includes the cases of patients treated in the hospital for anasarca and general debility who died within a few



months and in whom the gastric cancer was revealed only at autopsy. The second group comprises cases of rapid development in which anasarca seemed to be more a complication than a clinical form of gastric cancer. In the cases of the third group the duration of the anasarca was very much longer, in some instances lasting even a year or more.

Gouget's case belonged to Class 3. The anasarca began about a year before death and after having attained its maximum, almost entirely disappeared before death. Up to the time the patient died there were no gastric symptoms though the autopsy showed a cancerous neoplasm extending over the posterior stomach wall.

Gouget concludes therefore that stomach cancer of the anasarca type may evolve to the end without causing appreciable gastric symptoms; in fact, that apart from the oedema the only appreciable symptoms may be anemia and emaciation, the latter not noticed because of the former. The oedema may subsequently regress sufficiently to permit the patient to resume his occupation. The relatively good general health, the long duration of the oedema and its multiple regressions, and the absence of any objective symptoms remove the suspicion of cancer. Therefore examination of the blood, stomach contents, etc., should be carried out methodically. The repeated discovery of occult hæmorrhage will probably be the most reliable symptom turning attention to the presence of a neoplasm.

W. A. BRENNAN.

**Duval, P.: The Bilocular Aspects of the Stomach on Radiologic Examination** (A propos des aspects biloculaires de l'estomac à l'examen radiologique). *Arch. d. mal. de l'appar. digest.*, 1919, x, 163.

The bilocularity of the stomach which is often observed radiologically may be due either to anatomical factors or to temporary deformity. The author's study is intended to show how one may be distinguished from the other.

There are two great classes of gastric bilocalulations: (1) those radiographic bilocalulations which correspond to mediogastric stenoses due to parietal alterations; (2) the radiographic bilocalulations which do not correspond to anatomical bilocalulations of the stomach. The first type are true and permanent, the second transitory. In the transitory type a distinction must be made between bilocalulations due to (1) atony, (2) compression, and (3) spasm. The author gives illustrations of these types and discusses the subvarieties of spasmodic bilocalulation due either to incisura of the curvatures of the stomach or contraction rings.

Without doubt in every stricturing mediogastric lesion there is in addition to the permanent lesion an intermittent spasmodic factor which explains the slight variations of successive radiographic pictures.

The radiologic characters of bilocular stomach due to mediogastric stenosis are: persistence of the image when the patient assumes different positions,

at different times, and on insufflation of the stomach; the appearance first after the ingestion of bismuth of an upper pocket alone, later a thread of bismuth extending further, and finally a lower pocket; persistence of the image on manual compression of the pyloric pocket; and the special form, not regularly rounded, of the outline of the bilocalulation and the gastric causeway.

The surgeon ought not to accept or make a diagnosis of bilocular stomach on the basis of a single radiograph nor even on the basis of a small number of plates made at short intervals. Moreover, he ought personally to assist in such radiologic examinations.

Duval never operates upon a stomach unless he has himself assisted in its examination because in reality it is from the multiple details of the radioscopic examination—the mode in which the bismuth moves, the rhythm of evacuation, the forms of the stomach waves, etc.—that accuracy in diagnosis is reached. Exact information upon these points cannot be gained from radiographs alone.

W. A. BRENNAN.

**Wettstein, A.: Ileus Caused by a Murphy Button** (Ileus durch Murphyknopf). *Cor.-Bl. f. Schweiz. Aerzte*, 1919, xlix, 402.

During the period 1908–1911 the Murphy button was used constantly in the author's surgical clinic with always good results. In his more recent private practice, however, Wettstein reports that he has had 2 cases of ileus due to the use of the button. In the first, the button was retained several months after a gastro-enterostomy and the developments called for a laparotomy. The button was found about 20 centimeters above Bauhin's valve whence it was removed by ileostomy. Examination of the intestine showed that apparently the button had been incarcerated very much higher in the intestine, but probably during narcosis had become dislodged.

In the second case the complications which ultimately necessitated operation had continued for four and one-half years following a gastro-enterostomy. The symptoms pointed to intestinal obstruction. Radioscopic examination in this as also in the other case showed that the gastro-enterostomy orifice was functioning perfectly. The Murphy button was disclosed at apparently the level of the right horizontal ramus of the pubis. Laparotomy revealed it about 35 centimeters above Bauhin's valve whence it was removed by ileostomy. The intestinal lumen was completely obstructed. Both patients recovered.

Many cases of long retention of a Murphy button are reported in the literature, the time varying from one hundred and eight days to eight or nine years. The case of longest retention was reported by Kellung. In this instance the button was found in the stomach contents fifteen and one-half years after operation.

Wettstein has discontinued the use of the button



since 1913, preferring sutured gastro- and entero-anastomoses. In his opinion anastomosis should be obtained with the button only in cases in which the patient's condition demands a particularly rapid operation.

W. A. BRENNAN.

**Témoïn: The Surgical Treatment of Acute Appendicitis** (Traitement chirurgical de l'appendicite aiguë). *Bull. Acad. de méd., Par.*, 1919, lxxxii, 16.

In present-day surgical practice the surgeon has no other choice according to accepted standards than to operate upon cases of acute appendicitis which are seen within the first thirty-six hours. Opinions differ greatly, however, as to the advisability of operating upon cases seen after a longer interval, though the general rule is to wait until the crisis is passed and the appendicitis is "cold."

Témoïn reports his operative results in both types of cases as follows:

Up to 1911, 2,167 cases of appendicitis were operated upon, of which 1,442 were in the febrile stage. There were 48 deaths. Since 1911, operations have been performed upon 1,786 cases, 611 of which were in the afebrile stage and 1,175 within the critical stage. Of the latter, scarcely 100 were operated upon within the first thirty-six or forty-eight hours. The rest were from three to six days old. Five hundred and sixty lesions were limited to the appendix and from these there was only 1 death. In 281 cases there were encysted peritoneal abscesses. In this group there were only 3 deaths. One hundred and sixty-five cases were operated upon in the stage of localized peritonitis, the appendix having ruptured. In these there were 8 deaths. In 169 cases of more or less generalized peritonitis operated upon there were 25 deaths. There were, therefore, 3,953 operations and of these 2,617 were performed in the febrile stage of the condition with a total of 83 deaths, a mortality of 3.5 per cent.

From the figures given the author concludes that operation is the best method of treating appendicitis in any stage and that the surgeon should not regard any law which limits it to the first thirty-six hours. The sooner the operation is performed after the beginning of the condition, however, the better the results.

The operative technique advocated is simple. The abdominal cavity is opened and a digital exploration made of the inflammatory area. This is isolated by compresses from the surrounding intestinal loops and unless bound down by adhesions is brought to the surface where the operation is completed. With the appendix, the omentum and inflamed tissues are also resected. The stump of the appendix is then touched with tincture of iodine and the wound drained. Recovery was normal whether there was suppuration or not. After the operation the patient is put in the Fowler position and treated with the Murphy drip.

The author emphasizes the fact that often the development of peritonitis may not be suspected.

After an acute period there is a lull in the symptoms and the condition appears to be improved. This lull, however, is deceptive. The peritonitis following perforation or rupture of the appendix is at first confined to the lower part of the abdominal cavity but slowly reaches the level of the umbilicus and as a rule operation will then be too late. It is therefore important that the surgeon should be on guard so as not to be deceived by a temporary remission of the acute symptoms.

In Témoïn's experience there is one sign which makes the real condition manifest. If when the abdomen is palpated with the hand flat upon the abdominal wall and beginning at the left iliac fossa, a distinct pain localized on the left side is elicited rather than a sharp pain on the right side, the presence of pus in the lower pelvis can be affirmed.

W. A. BRENNAN.

**Skilern, P. G. Jr.: A Study of Chronic Appendicitis, with Special Reference to an Obscure But Constant Syndrome.** *N. York M. J.*, 1919, cix, 982.

Four case histories are presented in this article, each of which presented a definite syndrome.

The symptoms are: bad taste, which is usually constant; restless disturbed sleep; a tired feeling throughout the day; pains in the right iliac fossa radiating to the right thigh; and frequent accumulation of gas in the bowel, expulsion of which brings relief from the tired feeling.

This syndrome which was constant in nearly all of the author's cases is relieved by appendectomy.

E. A. PRENTY.

**Hallopeau, P.: An Inflammatory Tumor Developed around a Giant Appendix** (Tumeur inflammatoire autour d'un appendice géant). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 786.

Hallopeau's patient was a man 46 years old who had a tumor in the region of the right iliac fossa. The hardness and fixity of the growth, the absence of temperature and peritoneal reaction, as well as the patient's age and rapid emaciation led to a diagnosis of malignant neoplasm of the cæcal region.

On laparotomy the tumor was found to be continuous with the large intestine. The small intestine and the omentum which were closely adherent were dissected free and the growth then removed with the neighboring parietal peritoneum which was much thickened. The transverse colon having been cut near the hepatic angle and the small intestine at a distance of 10 centimeters from its termination, an end-to-side anastomosis was made. The postoperative course was uneventful.

On opening the intestinal segment removed no lesion was found in the mucosa. Coiled against the posterior surface, however, was an enormous appendix into which the index finger could be easily passed through the cæcal orifice. No fluid escaped from the appendix. The pathologic examination



demonstrated that the tumefaction was not a malignant growth but an inflammatory reaction associated with chronic appendicitis. The appendix showed diffuse chronic inflammation which had so affected its walls that they measured from 3 to 10 millimeters in thickness.

Pseudoneoplastic chronic appendicitis is not rare, but the case reported is exceptional in that the condition occurred in an enormous appendix the large dimensions of which appeared to be congenital.

W. A. BRENNAN.

**Boyer, E. E. H.: Primary Carcinoma of the Vermiform Appendix: a Review of the Literature, with a Report of Two New Cases.** *Am. J. M. Sc.*, 1919, clvii, 775.

The author emphasizes the importance of making a gross and microscopic examination of every appendix removed. There is no doubt that many cases of carcinoma of the appendix are not reported due to the lack of such an examination.

From a review of 300 cases of primary carcinoma of the appendix, several important facts have been brought out. Unlike most malignant growths, primary carcinoma of the appendix occurs comparatively early in life, most commonly between the twentieth and fortieth years of age.

Between 60 and 70 per cent of the malignant growths reported occurred in females. This may be accounted for, however, by the fact that a great many surgeons perform appendicectomy as a routine in gynecological laparotomies.

Less than 1 per cent of appendicular lesions are of primary malignancy. Since microscopic examination of the appendix has become a routine procedure, the number of cases discovered has been increased but the percentage is probably still very low.

The diagnosis of primary carcinoma of the appendix before operation is almost impossible. The symptoms are very closely allied to those of the chronically inflamed appendix. Usually there is no metastasis or infiltration of the surrounding glands and the clinical evidence denies the presence of such a growth.

The condition is undoubtedly secondary to a chronic inflammatory process of the appendix. In all such cases there is a history of appendicular trouble covering a space of several years.

The tumor formation is usually found at the tip of the appendix, but may involve the whole organ. On microscopic examination the majority of the cases show that the growth is confined to the mucous and submucous coats and has a slight tendency to infiltrate the muscular layers.

Two case histories are given, one a case of round-cell carcinoma found in a girl 26 years of age, and the other a case of a columnar-cell adenocarcinoma in a woman 30 years of age. In both instances there was a typical history of chronic appendicitis. The clinical diagnosis of appendicitis was corrected only by microscopic examination. E. A. PRINCE.

**Darnall, W. E.: The Advantages of the Vaginal Route in Resection of the Rectum for Cancer.** *J. Am. M. Ass.*, 1919, lxxii, 1670.

It is a well-known fact that sufferers from cancer of the rectum may live a long time, much longer than if they had cancer in almost any other part of the body. Cancer of the rectum offers more prognostic hope than does cancer in other locations. This is due largely to two factors: the fact that the type of cancer is usually adenocarcinoma which grows slowly, and the fact that the region about the rectum has a scant lymphatic supply, metastasis therefore being slow and occurring only after the growth has encroached upon other surrounding structures.

It is remarkable that cancer of the rectum may exist for so long without being discovered and when discovered is found not to have involved surrounding tissues. Indeed, many cases go on to a point where the rectum is completely blocked and obstruction of the bowel takes place before the growth is found, the symptoms being attributed to hemorrhoids or some other condition largely because a careful examination was not made.

Much has been written lately concerning the abdominal route, the sacral route, and the combined abdominal and perineal routes. The old Kraske operation and others have been relegated to the junk heap while the merits of still others and the value of a primary colostomy have been discussed at length. However, the author has been unable to find that much has been said about the vaginal route in women which he states is the simplest and easiest route of all.

It is undoubtedly true that in a greater number of operations on the rectum for cancer the condition of the patient is much improved by a primary colostomy. Toxins are eliminated, ulceration is given a chance to heal, and inflammation is reduced, whereby an inoperable case is often converted into an operable case. In addition, intestinal obstruction is obviated if impending, and the accompanying symptoms of pain, constant secretion, and defecation are relieved so that sleep and rest may be obtained. Recuperation is thus insured and the patient renews her usual routine of life and is soon put into a condition such that she may withstand the more radical major operation successfully.

The technical advantages of the vaginal over the sacral route should be apparent to all who understand the anatomy of the pelvis. There are no important structures to be taken into account below the peritoneal fold except the two tubes which pass out through the levator ani muscle, namely, the vagina and the rectum. The operation by the vaginal route therefore consumes less time and causes less traumatism to the tissues and less hemorrhage. Consequently there is less shock, which is an important factor in the cases of these patients. Moreover, no resection such as is necessary in most perineal and sacral operations is required. The author has always been of the



opinion that the chiseling and sawing of bone in any operation must add to the shock materially. The dissection by the vaginal route is easy, the exposure is more perfect, and the work is done in an open field rather than in the dark, making it possible to control hæmorrhage completely.

Instead of being the *bête noire* of surgery, this operation for resection of the rectum for cancer therefore resolves itself into little more than a complete dissection of the perineal structures for extensive vaginal repairs. The late John B. Murphy was an ardent champion of the method of approach described and did much to develop its technique. The operation is practical, however, only when the tumor is movable and is situated in the lower half of the rectum. If it is as high as the rectosigmoid juncture, the combined abdominal and vaginal routes should be employed.

In beginning the operation the sphincters are thoroughly divulsed and the secretions of the rectum well washed away. A transverse incision is then made across the vagina at the juncture of the mucous membrane of the posterior vaginal wall and the cervix. A median incision perpendicular to this is then carried down the whole length of the posterior vaginal wall over and through the perineum down to the anus. This incision should semicircle the anus if it is planned to retain the sphincters. If the sphincters are not to be retained, it should continue completely around the anal margin. As the long perpendicular incision is deepened through the vagina and perineum down to the rectum a large thick flap of tissue, made up of the muscular and ligamentous attachments of the vagina and rectum, is laid back on each side. When the rectum is reached by the fingers after blunt dissection down on either side the hand is passed completely behind it. It may then be pulled forward easily and lifted from its bed. It is remarkable how much of a loop of bowel may be thus pulled down. If it does not come down as freely as it should, the posterior layer of the mesentery of the lowest part of the sigmoid may be cut.

A right-angled rubber-tipped clamp may then be applied above the growth at least 2 inches from its margin, and the rectum divided. If the sphincters are to be preserved the distal end of the rectum is similarly divided below the tumor. An inch rubber tube is then sewed into the upper end of the bowel and brought out through the anus. Over this the anastomosis of the bowel is completed. After making the anastomosis it is well to draw the tubing down, invaginating the upper into the lower end, and make a double row of sutures so as to re-inforce the union and prevent leaks.

In case the sphincters are removed with the rectum, the upper end of the bowel is brought out a full half inch or more beyond the anal skin and sewed fast to it. There is apt to be less stricture when the sphincters are removed than when they are not, but of course at the expense of fecal control. To prevent stricture it is nearly always necessary to

dilate the newly formed rectum with bougies as an after-treatment.

When the rectal work has been completed the muscles of the perineum are built up layer by layer just as they would be in an extensive perineal repair, the lower lip of the cervix being sewed down to the transverse upper incision in the vagina.

### LIVER, PANCREAS, AND SPLEEN

**Bevan, A. D.: Amoebic Abscess of the Liver.** *Surg. Clin. Chicago*, 1919, iii, 765.

Bevan's case was that of an Italian, 30 years of age, who gave a history of an acute infection in the right upper quadrant of the abdomen and the lower part of the right chest, associated with pain, tenderness, chills, fever, and later jaundice. The symptoms and signs at first resembled those of pleurisy or pneumonia and subsequently those of an empyema. The X-ray, however, showed a clear right lung and a high-standing diaphragm on the right side. A large painful swelling in the right upper abdominal quadrant just under the costal arch aided in establishing the diagnosis of liver abscess. The hæmoglobin was 29. The abscess was opened and drained under local anæsthesia. On microscopic examination motile amœba were found in the fresh pus.

R. B. BETTMAN.

**Bevan, A. D.: Obstruction of the Common Bile-Duct.** *Surg. Clin. Chicago*, 1919, iii, 737.

In presenting a case of cholelithiasis, Bevan brought out the following points: Upon reaching the stage in the operation in which he dissects the hepatic, cystic, and common bile-ducts, he changes from the usual position at the patient's right side to the patient's left side and by so doing obtains a clearer view of the operative field. The dissection must be done very carefully as the hepatic bile-duct may be easily mistaken for a band of adhesion. By splitting the gall-bladder, the cystic and common ducts may be found more easily. In the case reported the hepatic duct was drained by means of a soft rubber catheter and the site of the cystic duct by iodoform gauze stripping in a split-rubber tube.

R. B. BETTMAN.

**Oliani, E.: Obstruction of the Bile-Ducts by Echinococcus Cysts** (Occlusione del coledoco da cisti di echinococco). *Policlin.*, Roma, 1919, xxvi, sez. chir., 177.

The mortality of cases of echinococcus cysts in the bile-ducts is high, being 70 per cent, but the condition is rare. Oliani has been able to find records in the literature of only 10 cases that have been operated upon. He himself reports one case which was that of a man aged 44 years. The patient, who stated that he had had typhus, malaria, and epigastric hernia, recently experienced severe pain in the gastric and dorsal regions and had become jaundiced. The liver was enlarged and the region of the gall-bladder painful.



As the symptoms did not abate, an operation was performed. The laparotomy revealed the presence of a tumor with apparently fluid contents attached to the hepatic ligaments. This was resected. The walls of the gall-bladder, which was small, were thickened and adherent to the colon and duodenum. The common duct was much dilated and apparently contained a rounded body. Upon opening it a ruptured cyst the size of a nut was extracted. The duct was otherwise normal. The wound was closed with a drain. The drainage tube and dressings were removed on the twelfth day. On the thirteenth day a number of cysts similar to the one found in the bile duct, some of them ruptured and some intact, were discharged through the wound opening. The patient left the hospital on the twenty-second day but still had a small fistula. The latter closed rapidly. The cysts were found to be echinococcus cysts.

In this case the common duct had been obstructed by secondary cysts arising from a primary cyst on the hepatic ligaments which had ruptured into the bile duct.

W. A. BRENNAN.

**Deaver, J. B.: Carcinoma of the Gall-Bladder.**  
*Med. Rec.*, 1919, xcvi, 47.

Every case of cholecystic inflammation that does not yield to medical treatment within a reasonable time should be operated upon.

In all cases of gall-bladder infection, whether there are calculi or not, operation should include the removal of the appendix as the probable source of infection and the examination of other upper abdominal viscera for associated disease.

A pre-operative diagnosis of carcinoma of the gall-bladder in its early stage is not possible, and even in the late stage the clinical diagnosis may be incorrect.

Early cases of cholecystic inflammation should have the benefit of operation in order that the menace may be removed while it is still local and eradicable.

W. E. LOWER.

**Guibé: Three Cases of Hæmorrhagic Pancreatitis**  
(Trois cas de pancréatite hémorragique). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 646.

Guibé reports three cases of hæmorrhagic pancreatitis, all those of women. Such cases are rarely observed in France. In the three reported a laparotomy was performed and two of the patients recovered.

Before operation the symptoms in the three cases were very dissimilar. In the first there was nothing to distinguish the condition from advanced generalized peritonitis. Neither did any of the symptoms or the history in the second case suggest an affection of the pancreas. In the third case, the condition was ascribed to the pancreas owing to the localization of the pain in the pancreatic zone and the presence of a marked tumefaction in that region. The laparotomy showed, however, that this tumor which was believed to be pancreatic was only an indurated omental mass.

In the course of the operation the diagnosis was easily made as soon as the omentum was seen to be studded with spots.

Although the condition is certainly very grave, Guibé does not believe that an extremely pessimistic view should be taken with regard to its prognosis. While undoubtedly there are very serious acute cases which develop rapidly, all cases are not necessarily of this type and the rapid acute cases are not more frequent than the acute cases. The three patients operated upon by Guibé unquestionably had the merely acute form of pancreatitis.

The author's first patient was operated upon three days after the onset of the crisis and lived two days afterward. In the other two cases the operations were performed on the third and fifth days after the onset respectively. Both patients recovered.

The improvement in the mortality statistics of this condition depends upon early intervention. Surgical treatment should consist of evacuation of the hæmorrhagic fluid contained in the abdomen and drainage of the pancreatic region.

Although it was not done in the cases reported, Guibé believes that the bile passages should always be explored in the cases coming to operation.

W. A. BRENNAN.

**Willis, A. M.: Traumatic Rupture of the Normal Spleen.** *Surg., Gynec. & Obst.*, 1919, xxix, 33.

The article reports four cases of subcutaneous rupture of the spleen, the results of experimental investigations, and a short review of the literature.

The four cases were alike in that all of the patients were males who had received a blow on the left side of the body in the splenic region, there was no evidence of injury, and there were secondary anemia, leucocytosis, rigidity and tenderness of the abdomen, and shock following splenectomy. In all of the cases also the spleen was found to have a short pedicle and was practically normal. Three of the four patients had agonizing pain in the left shoulder which was relieved by the operation. In 2 cases a marked increased leucocytosis persisted after the splenectomy for from two to four weeks. Three of the patients recovered. The other, who died eight days after operation, showed a continuous fall in hæmoglobin and in the number of leucocytes. In the first 2 cases direct transfusion was done with apparently good results.

The experiments reported were performed upon dogs which were divided into three groups. Upon those of Group 1 a splenectomy with no loss of blood was performed, upon those of Group 2, a splenectomy with loss of blood, and upon those of Group 3, a splenectomy with loss of blood followed by transfusion.

Following the operation the majority of the animals of Group 1 showed only a slight decrease in hæmoglobin. A few showed no loss, and a small number, a loss up to 60 per cent with gradual return to normal.



In Group 2 the operation with loss of blood until the hæmoglobin registered 70 per cent was followed in the majority of the animals by a decrease to 60 per cent with gradual return to normal. One of the dogs died on the seventh day with marked anæmia. Two showed a hæmoglobin decrease to 45 per cent which was followed by a gradual rise.

In Group 3 the results were similar to those obtained in the majority of the dogs in Group 2.

In 1909 Brogsitter reviewed the literature of traumatic rupture of the spleen and collected 203 cases treated by surgical means. This number may be divided into two series, the first one up to and including the cases summarized by Berger in 1907, comprising a total of 168 cases, and the second up to and including the cases reviewed by Brogsitter, a total of 35 cases. In the first series splenectomy was performed in 135 instances, with a mortality of 38.7 per cent. Barnes in 1914 reviewed the literature since Brogsitter's paper and found the reports of 30 cases of rupture of the normal spleen occurring between 1909 and 1914, his own case making a total of 31 cases. Since Barnes' paper there have occurred or were omitted from his summary 53 cases, those reported in this article by Willis increasing the total to 57. Splenectomy was performed on 55 patients with a mortality of 28.88 per cent.

Suture, tamponade, or a combination of the two appears to give a distinctly better result as the mortality of the patients treated in this way for the four series was 25, 0, 0, and 8.3 per cent respectively.

P. M. CHASE.

#### Mayo, W. J.: The Results of Splenectomy in the Anæmias. *Ann. Surg.*, 1919, lxx, 22.

Splenectomy as a curative agent has been given a fair trial in three types of the anæmias—splenic anæmia, pernicious anæmia, and hæmolytic icterus—and its successes and failures can be reasonably shown by the data at hand.

##### SPLENIC ANÆMIA

While splenic anæmia is a clinical entity, it cannot be said to have a definite pathologic existence. It may be defined as a fibrotic splenomegaly with marked endophlebitis causing a secondary type of anæmia which is progressive but not constant until the later stages. This secondary anæmia has no special characteristics except that as a rule it is accompanied by a leucopænia although the author has seen otherwise typical cases in adults with leucocyte counts from 10,000 to 12,000. Splenic anæmia was designated by many of the early observers "splenic pseudoleukæmia" and it is believed by some clinicians of the present day that von Jaksch's disease (infantile pseudoleukæmia) is an infantile form of splenic anæmia in which a moderate leucocytosis due to the higher value of leucocytes in the normal blood of infants is to be found.

A few clinicians regard all splenic anæmias as syphilitic in origin but the author's experience does not bear out this theory. Chronic enlargements of

the spleen that are accompanied by anæmia and are the result of various protozoa, syphilis, malaria, kala-azar, etc., as well as those anæmias due to bacteria, typhoid, and tuberculosis, were removed from the splenic-anæmia group when their etiology was discovered. A much better idea of splenic anæmia would be obtained if the pathologic condition of the spleen and its effect on the blood were made the criteria and all cases of known causation as well as those of unknown causation were classified as splenic anæmia, assuming that in the course of time the toxic agents which produce the condition of the spleen will be found.

In 5 cases in which large spleens of chronic intractable syphilis with severe anæmia were removed, the patients have been carefully treated for syphilis for months. After the removal of the spleen, the anæmia rapidly disappeared and the syphilis was cured with comparatively mild antiluetic treatment such as had previously failed to affect either the syphilitic condition or the spleen.

The relation of splenic anæmia to Banti's syndrome is most interesting. The majority of clinicians seem to agree with Moschowitz in the conclusion that there is no real difference between the two and that Banti's disease is merely a late phase of some cases of splenic anæmia.

Of 61 patients with splenic anæmia whose spleens were removed, 7 (11.7 per cent) died. These statistics extend to Dec. 31, 1918, and include as operative deaths those of all patients who died in the hospital, without regard to the cause of death or the length of time that had elapsed since the operation. The deaths were those of patients operated upon in a late stage of the disease and who had a high grade of anæmia, ascites, and cardiorenal manifestations. It would appear that the spleen, acting as a filter, removes noxious agents, both micro-organisms and chemical toxins, from the blood-stream and sends them to the liver for destruction; in certain instances cirrhosis of the liver as well as fibrosis of the spleen results from the chronic irritation produced by such substances.

Both portal cirrhosis and splenic anæmia lead to death through portal obstructions, and the hæmorrhages and ascites are due to back pressure. Removal of the spleen reduces the amount of blood delivered by the portal vein to the liver by at least one-third. If the spleen is removed early in splenic anæmia it is probable that the liver will not show serious evidences of disease. Even when cirrhosis of the liver is well marked and ascites is present, removal of the spleen often nearly effects a cure. Five of the 61 cases were not definitely diagnosed but more nearly fitted into this group than any other.

##### PERNICIOUS ANÆMIA

The etiology of pernicious anæmia is unknown, the early symptoms are indefinite, and by the time the diagnosis can be made the condition is incurable. The disease may be described as a progressive degeneration of the red blood in which there is a loss



of blast cells or mother cells of the erythrocytes; the blast cell when lost is not replaced. In contrast to splenic anæmia which is of the secondary type, the blood-picture in pernicious anæmia has characteristic cells which mark the disease. If it might be asserted that in cases of pernicious anæmia in which the hæmolysis is most marked the patient has a greatly enlarged spleen or that the spleen exhibits definite pathologic changes, a direct connection between the enlarged spleen so often found and the disease would be established. Unfortunately, experience does not support this hypothesis and the size of the spleen does not seem to bear definite relationship to the severity of the disease. After death from pernicious anæmia the necropsy as a rule shows a small spleen, but in 2 cases only was the spleen below normal (195 grams, Sappey) at operation, and both were terminal cases.

The average weight of the spleen removed in the series of cases of pernicious anæmia reported was 400 grams, exclusive of two large spleens, one of which weighed 2,220 grams and the other 1,600 grams.

Any form of treatment for pernicious anæmia may prove or at least may appear to be beneficial. Even without treatment such patients have their ups and downs. Therefore in pernicious anæmia splenectomy is not based on sound reasoning and there seems to be little foundation for the belief that the procedure will cure the condition. In the investigation of the cases of splenectomy for pernicious anæmia in this series, however, great though temporary improvement was noted. There was a gain in weight and an improvement in the blood from an average hæmoglobin of 38 to 72 per cent, and in the number of red cells from 2 to 4 million. Splenectomy seems at least to have instituted a means of effecting marked palliation.

Since there is an operative mortality, good reasons must exist for substituting operation for repeated blood-transfusions. Fifty patients with pernicious anæmia have been splenectomized with three deaths (6 per cent). Like those given for splenic anæmia, these statistics also extend to Dec. 31, 1918 and include as operative deaths the deaths of all patients who died in the hospital, without regard to the cause or the length of time that had elapsed since operation.

#### HÆMOLYTIC ICTERUS

Hæmolytic icterus has not been classified with the anæmias although the peculiar splenic activity results in an anæmia which is the cause of death. As in splenic and pernicious anæmia, the etiology of hæmolytic icterus is unknown. The well-developed case of hæmolytic icterus stands out with a vividness unequalled in splenic anæmia and pernicious anæmia. The characteristic features of hæmolytic icterus are an enlarged spleen, chronic jaundice with exacerbations, normally bile-colored fæces, and absence of bile in the urine.

It is certain that in hæmolytic icterus the spleen destroys the red corpuscles unnecessarily; the en-

largement of the spleen may be in the nature of a work hypertrophy. Enlargement of the liver is usually present and may also be a work hypertrophy. In some of the cases in this series sections from the liver showed definite hyperplasia of liver cells.

#### HÆMOLYTIC ICTERUS AND THE LIVER

In hæmolytic icterus an occasional case is found in which there is associated biliary cirrhosis. The enormous destruction of red corpuscles in the spleen inundates the liver with blood pigments and renders the bile thick.

The viscid bile in hæmolytic icterus tends to form gall-stones. Sixty per cent of all patients with hæmolytic icterus operated upon had associated gall-stones and all the possibilities of biliary duct infection. It may be understood readily why biliary cirrhosis is sometimes associated with hæmolytic icterus and why the two diseases have been confused. Hæmolytic icterus has been most often confused with the elusive syndrome termed "Hanot's cirrhosis" which so far as is known has no pathologic or clinical foundation.

The triumph of splenectomy is the cure of hæmolytic icterus. Only patients in a terminal condition with secondary gall-stones and cirrhosis of the liver fail to be relieved. The only patient lost of the 27 splenectomized for hæmolytic icterus was one who was operated upon during an acute exacerbation.

#### MISCELLANEOUS

**Tuffier and Letulle: A Disease Characterized by Gaseous Cysts of the Abdomen** (Sur une maladie caractérisée par des kystes gazeux de l'abdomen). *Bull. Acad. de méd., Par.*, 1919, lxxxii, 5.

The authors give detailed clinical histories of 2 cases of a curious abdominal condition in which multiple cysts containing gas and often extremely numerous are found in the intestine, omentum, or mesentery. Bang described the first case of the kind in a human subject in 1876, and since then about 166 others have been reported. The syndrome consists of the presence of the gaseous cysts with stenosis of the small intestine and pylorus.

In one of the cases reported by Tuffier and Letulle death resulted from the mechanical complications due to the cysts. Both cases were operated upon. In the first the small intestine, especially in its lower part, was constricted and studded with multitudinous cysts. Similar cysts were found in the omentum. The other parts of the intestine were much dilated. The abdomen was closed as no operative measure suggested itself which it was thought would relieve the condition. In the second case a posterior transmesocolic gastro-enterostomy was done to remedy the subpyloric stenosis due to the cysts. This patient made an excellent recovery.

As a rule the cysts are found in the small intestine and very rarely in the large intestine. Generally they do not give rise to any symptoms, the patients in whom they are discovered being operated upon



for some other abdominal condition. In the majority of cases they ultimately disappear.

The authors discuss the theories as to the origin and nature of such cysts but do not express any definite opinions. The gas they enclose is a mixture of oxygen, hydrogen, and nitrogen. A histological study is now being made the results of which Letulle will publish later.

W. A. BRENNAN.

**Soresi, A. L.: Diaphragmatic Hernia.** *Ann. Surg.*, 1919, lxi, 254.

Diaphragmatic herniæ are congenital, traumatic, or the result of the weakening or destruction of the diaphragmatic wall by a collection of pus on either side. Congenital herniæ may not be present at birth, but may develop later through a congenital defect in the muscles of the diaphragm. This weak point is usually at the œsophageal opening, although the possibility of the occurrence of herniæ about the vena cava or the aorta must be admitted. Owing to the protection of the liver on the right side, practically all of the herniæ are situated on the left.

The symptoms of diaphragmatic herniæ are quite complex because so many factors are involved. They may vary from symptoms relating to the heart or lungs, or both, to a sensation of heartburn. There may be difficulty in taking long breaths, occasional vomiting, or vomiting after every meal. The more severe symptoms, such as difficulty in swallowing, pain due to adhesions of the stomach to the diaphragm, and evidences of intestinal obstruction are rare when the herniæ are small. Various nervous symptoms due to sex, temperament, or profession further complicate the picture.

The author reports three cases in none of which was the diagnosis made prior to operation and in two of which the condition had been overlooked in a previous operation. Probably all three of these patients would have died from the condition without a proper diagnosis, and unless an autopsy had been performed no report of the cases would have been made. The author therefore believes that diaphragmatic herniæ are much more frequent than the reports in the literature would lead us to assume.

The larger herniæ are revealed by the X-ray, but the smaller ones are not shown by the fluoroscope unless there are adhesions of the stomach to some thoracic viscus. In suspected cases the author advises the examination of the patient in the Trendelenburg position after the ingestion of the barium mixture.

The treatment is obviously operative. The diaphragm should be carefully explored when no other condition is found which seems to account for the symptoms referable to the upper abdomen. As most cases are discovered in the course of abdominal operations, this route seems to be the best. In the rare case it may be necessary to use the chest route also.

Although there may be strong adhesions between the abdominal viscus and the hernial sac, clean dis-

section will usually make it possible to restore the herniated organ to its proper place without much hæmorrhage. It is necessary to make a large incision so that good exposure may be obtained. On the basis of experimental work it would seem that the diaphragmatic opening might be safely enlarged to free herniated organs. The best light for operations upon the diaphragm is the frontal lamp.

It is well to remember that, unlike other muscles, the diaphragm cannot be put at rest during the repair of a hernia. It is doubly necessary that good approximation be obtained. In order to do this, the author has worked out a method of suturing which will keep the edges overlapped. With silk on a curved needle a number of stitches are taken parallel to the edge of the opening on each side. These stitches are tied together on each side and then tied across. The ends of the hiatus are well closed by purse-string sutures. In the after-treatment the author has used an elastic abdominal binder with very gratifying results and much comfort to the patient.

GATEWOOD.

**Fiolle, J.: Severe Lesions of the Mesentery in a Strangulated Hernia** (Les lésions graves du mésentère dans la hernie étranglée). *Bull. et mém. Soc. de chir. de Par.*, 1919, xlv, 82.

Fiolle gives the clinical history of a case which he states is the eighth case reported of mesenteric separation in the course of strangulated hernia. The other 7 cases also were reported by French surgeons.

Fiolle's case was that of a woman aged 62 years who presented the clinical picture of obstinate constipation with abdominal pain and biliary and fæcal vomiting. A small and hard tumor could be palpated in the right femoral region. On operation the sac was found to contain an intestinal loop with an omental fringe and a few drops of clear serous fluid. The crural ring was incised and the hernia entirely freed. It was then perceived that for about 8 centimeters the mesentery was completely separated at a distance of a few millimeters from the bowel wall. Except in one small zone the intestinal loop was not gangrenous and the upper portion of the ruptured mesentery was quite intact. There was no oozing of blood, the mesenteric vessels being thrombosed. The author resected the hernial sac and the part of the intestine which was deprived of its vascular nourishment. An end-to-end anastomosis was then done and the wound closed with drainage. After operation the vomiting continued. The patient died the following day with symptoms of stercoræmia.

Fiolle takes exception to the opinion expressed by Guibé that taxis is always the cause of this complication. There was no taxis whatever in the case reported.

The important point in this case to which attention is called was the complete obliteration of the vessels of the torn mesentery; in the other cases reported the peritoneum or the sac was flooded with



blood. As there was no trace of blood in this instance the vascular obliteration must have preceded the mesenteric rupture.

It is therefore possible that in a strangulated hernia the mesenteric circulation may be totally interrupted without the formation of any visible lesions in the corresponding part of the intestine. This fact Fiolle thinks important as it explains certain accidents which may occur after an operation for strangulated hernia which did not present particular difficulties. The examination of the intestine alone is not sufficient to determine the vitality of a herniated loop. The loop may appear healthy at the time of operation and become gangrenous some

days later because its nourishing vessels are thrombosed.

Generally when the contents of a strangulated hernia are examined sufficient attention is not paid to the mesentery. The mesentery should be examined as carefully as the strangulated loop. Fiolle is unable to state, however, how it may be determined whether the vessels are obliterated or not.

Generally in cases of mesenteric separation the mesentery is torn quite close to the intestine and there are no nourishing branch vessels left. In such cases hæmostasis must be effected, the loop deprived of its vessels resected, and the continuity of the intestine re-established.

W. A. BRENNAN.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES.

**Gorsline, C. S.: Familial Deforming Chondrodysplasia Multiple Exostoses.** *Am. J. Roentgenol.*, 1919, vi, 271.

After a thorough review of the rather scanty literature on the subject the author reports in detail four cases of this interesting condition. In every case there was a family history of multiple exostosis with resulting deformity. Three of the cases were of the same immediate family, a mother, a daughter, and a son.

The etiology of the condition is not known but heredity plays a very important part. The growths are of three types: spurs, tubercles, and pedunculated and cauliflower-like masses.

The long bones are most often affected. The growth begins to develop early in life and is not painful.

In closing his article Gorsline requests roentgenologists to report in detail all cases of this condition coming under their observation in order that we may obtain some clue as to the etiology. W. A. EVANS.

**Beck, C.: Webbed Fingers.** *Surg. Clin. Chicago*, 1919, iii, 723.

The author presents a case of syndactylism in a 15-year-old girl who had been operated upon as a child. The web had simply been split. As usually happens when only this is done, the resulting scars had caused great impairment of motion.

In such cases a real plastic operation should always be performed. A simple procedure is to form a tube out of a small rectangular flap cut from the dorsal surface, slip this tube through a slit at the very base of the web, and suture it into the palmar surface. A rubber catheter around which the skin can be formed, facilitates this manœuvre greatly. After a few days the catheter is removed, leaving a button-hole opening at the base of the web. The web is now split into the button-hole,

the edges being secured on either side with a few sutures.

In Beck's case this could not be done because of the adhesions. Sufficient skin for a plastic operation could not be obtained from the dorsal or palmar surfaces of the hand. The hand was therefore sewed to the chest from which the skin necessary for a plastic operation was obtained by the formation of a pedunculated flap. A week later the flap was cut at its base and sutured into the denuded area. A good functional result was obtained.

R. B. BETTMAN.

**Dubs, J. Hoffa's Disease: Proliferation of the Fatty Tissue of the Knee-Joint Due to Trauma** (Ueber die traumatische Fettgewebsswucherung im Kniegelenk: Hoffa'sche Krankheit). *Cor.-Bl. f. Schweiz. Aerzte*, 1919, xlix, 289.

Dubs describes 7 cases of the disease which was described for the first time by Hoffa in 1904. This is an affection of the knee-joint characterized by inflammatory hyperplasia of the subpatellar fatty tissue and its progressive transformation into fibrous connective tissue following trauma. There are two types: (1) that in which there is an inflammatory hyperplastic process limited to the subpatellar fatty tissues; and (2) that showing fibrous degeneration of the subpatellar fatty tissues with more or less involvement of the synovial sac. The condition arises either from a single severe injury or several repeated slight injuries such as might result from the presence of a foreign body in the joint.

The clinical objective signs as studied by Dubs are: (1) a more or less marked atrophy of the quadriceps; (2) a pseudo-fluctuating swelling, situated immediately beneath and on each side of the patella, which is not particularly painful on pressure; (3) a slight grating in the joint upon passive or active movement; (4) the X-ray demonstration of a slight shadow between the patella and the tibiofemoral joint surfaces.

The only method of treating this condition



radically is to extirpate the subpatellar mass. In the early stages, however, when the symptoms are not very marked, massage, compressive bandages, etc., may be of value.

W. A. BRENNAN.

**Painter, C. F.: Internal Derangements of the Knee-Joint.** *J. Orthop. Surg.*, 1919, xvii, 416.

The two most common periods of young manhood when derangements of the knee-joint occur are at the extremes of adolescent life.

The three most common injuries are injuries of the semilunar cartilages, injuries causing hypertrophy of the alar ligaments, and those followed by bicipital bursitis.

Injuries of the semilunar cartilage are of two types, i.e., (1) rupture, and (2) a tearing loose and fracture of the cartilage.

Rupture of the cartilage is usually associated with effusion, pain, lameness, and localized tenderness, but seldom with definite locking of the joint.

In the second type of injury the fracture of the cartilage occurs usually at the juncture of the inner and middle thirds of the internal meniscus. This is followed by injection of the synovia, effusion into the joint, thickening of the synovial membrane, and injury and hypertrophy of the alar ligaments. It is impossible to cause a tear of the semilunar cartilage when the leg is fully extended unless there is a fracture or dislocation of the knee-joint.

Radiographic studies are helpful, especially with injections of oxygen into the quadriceps pouch which will show a black shadow behind the loosened cartilage.

After once making the diagnosis, excision of the meniscus is the only satisfactory treatment. The incision should be slightly curved and toward the median line in its lower third. Only instruments should be inserted into the joint. In closing the incision the capsule and the skin should be closed separately. This having been done, a firm compression bandage should be applied without a cast. Early manipulation is advised.

Hypertrophy of the alar ligaments usually follows trauma to the front of the knee-joint which does not cause locking. The swelling is on either side of and below the patella. The symptoms develop progressively. Motion is usually not prevented.

In these cases the joint should be immobilized early to prevent further injury. Operation is rarely necessary and required only in the chronic cases. Early motion should follow operation to prevent the formation of adhesions.

Bicipital bursitis follows trauma due to inordinate use of the biceps femoris and shows typically a tense swelling the size of a quarter on the outer side of the knee-joint. Operative removal is the only treatment that gives permanent relief. Care should be taken to avoid injury to the external popliteal nerve.

The article contains the histories of two cases of displaced semilunar cartilages. M. H. HOBART.

## FRACTURES AND DISLOCATIONS

**Harsha, W. M.: Fractures.** *Surg. Clin. Chicago*, 1919, iii, 589.

The histories of three cases are given which illustrate the value of patience and mechanical ingenuity in the treatment of fractures; a method of correcting deformity by extension in a cast; and the correction of an angular deformity by cutting the cast on the concave side and bending it to the necessary degree.

**CASE 1.** The patient had a fracture of the surgical neck of the left humerus with the usual internal displacement of the shaft toward the axilla and internal rotation but no overriding. Reduction was accomplished under anesthesia by abduction and outward rotation. Extension was maintained by adhesive strips reaching from the site of fracture to the elbow, with counterextension by a sling under the well-padded axilla. The entire arm, flexed at the elbow, was then encased with the chest in plaster, the upper arm being in moderate abduction.

After ten days the cast was cut from the lower arm and in three weeks the outer half was cut away, exposing the shoulder. Massage of all accessible parts was then instituted. After another week the body cast was removed, only an angular splint being left to support the upper area. This was maintained by a spica or adhesive. Complete restoration was obtained in six weeks.

**CASE 2.** The patient, a man 40 years of age, had an extensive comminuted fracture involving the middle and lower third of each femur, with severe crushing of the soft parts. Neither fracture was compound. Reduction was made on the Hawley table and a cast applied extending from the ankle to the waist line with flexion at the knees. The left leg united without change of position, but the right retracted before union took place and further correction was necessary.

When the cast became loose because of subsidence of swelling and the atrophy of disuse of the muscle some extension was necessary in addition to that afforded by the plaster. As after three weeks the patient complained of severe pain which was not present after proper reduction and thorough fixation, the cast and the upper half were cut away longitudinally to the hip and moleskin applied for extension to the side of the leg up to the knee. Plaster of Paris was then re-applied so as to include the lower half of the cast, and an extension of 15 pounds was maintained for three weeks.

The X-ray of the left leg after the cast was put on showed a slight deflection or angular displacement of the lower fragment. The cast was therefore cut through opposite the break in a circular manner for about three-fifths of the circumference on the outer or concave side of the displacement and the angular displacement corrected by binding the uncut part of the cast. The cast was then reinforced with additional plaster.



In six weeks good union in both legs was obtained with slight deformity in the right and  $\frac{1}{2}$ -inch difference in length. In severe cases therefore it is better to apply extension from the beginning. Measurements may be taken by exposing the anterior superior spine of the ilium and the internal malleoli. If angular displacement is present about one week should elapse before correction is made.

Case 3 was that of an aviator, aged 25, who in falling 300 feet received fractures which involved the upper alveolar process in front and the rim of the left acetabulum and included a fissure, a Potts' fracture of the left ankle, and a transverse fracture of the left humerus. Nine days after the accident the fractures were reduced and a body-cast applied. Correction of the angular displacement was done as in Case 2 about one week later.

The correction of an angular displacement is easily accomplished by cutting the cast transversely on the concave side after the swelling has subsided, usually at the end of about a week, exercising care to leave one-fourth of the circumference of the cast uncut and so placed that the bending will be properly directed.

By leaving the moleskin plaster used for extension in place, a longitudinal displacement may be corrected by cutting away the posterior half of the cast on both the upper and lower arm and leaving a cuff of the cast at the wrist. After the cast has been removed in this way, extension should be made on the arm and a pad placed between the forearm and the remaining anterior splint. The body-cast provides firm counterextension. Many fatal open operations might be avoided by patience and ordinary mechanical ingenuity.

P. H. KREUSCHER.

**Bulkely, K., and Sinclair, D. B.: Fracture of the Femur.** *Ann. Surg.*, 1919, lxix, 466.

From an analysis of 131 consecutive cases of fracture of the femur in which there was a complete loss of the ability to bear weight the following conclusions seem justified:

Compound fractures are always serious and are frequently poorly treated by inexperienced men with resultant loss of life. Such fractures should be operated upon only in places which furnish accommodations for continued after-treatment. Patients with fractures of this kind should not be moved for at least a month after operation, and it is much better to move them immediately to a hospital in the rear without operation than to attempt open treatment and move them immediately afterward. The chief danger lies in infection, gas gangrene in the early weeks and streptococcus infection in the later weeks. Both can be combated best by early, adequate, and radical surgery.

Bullet fractures are practically as dangerous as are those produced by shell fragments. The occasional bullet wound may be treated without operation, but the shell wound should always be treated surgically.

Fractures splitting into the hip- or knee-joints are infinitely more dangerous than those involving only the intermediate portions of the bone. Probably those involving the hip should always be treated by amputation and disarticulation. The majority of those involving the knee will require resection or amputation. The primary operative procedure should be radical. Too many attempts are made to save worthless limbs with disastrous results to life.

The ideal traction is skeletal and this form is practically without danger. Femoral traction is better than tibial traction.

If more attention were paid to operative treatment, less would be heard of the chemical treatment of wounds as it would be unnecessary. The authors are of the opinion that the majority of wounds properly operated upon will progress more quickly and favorably if dry rather than wet dressings are used.

GATEWOOD.

**Buchbinder, J. R.: Gunshot Fracture of the Femur.** *Surg., Gynec. & Obst.*, 1919, xxix, 70.

The author discusses the details of the treatment of gunshot fractures of the femur which he regards as the most difficult of all fractures so far as treatment is concerned. This is due chiefly to the large muscular mass surrounding the femur.

The objects immediately to be accomplished in handling such fractures are: (1) immediate reduction and fixation; (2) the earliest possible control of wound infection; (3) ease of access to the thigh at all times for inspection and palpation; (4) repeated X-ray control until bony union has occurred; (5) a means of moving the patient without disturbing the fracture; and (6) early and constant mobilization of the knee-joint.

Immediate immobilization should be a cardinal rule in the treatment of every fracture as it lessens trauma to the soft tissues and renders reduction easier.

Traction is regarded as the most logical method of maintaining reduction. Plaster or splints which do not maintain traction have a very limited field of usefulness in the treatment of gunshot fractures of the femur.

Buck's extension is the most common means of applying traction but has several serious drawbacks to its routine use. It may fail to correct over-riding because, instead of reaching the femur, the pull is lost in the intervening mass of thigh muscles. In many instances also fractures in the lower third of the femur cannot be reduced by this method because there is not sufficient skin distal to the fracture for purchase. Moreover, the presence of adhesive straps near an open wound is objectionable.

Caliper extension is an ideal type of extension in the treatment of open fracture of the femur. By this method less pull is necessary for reduction, and, being applied directly to the femur, the pull is certain. Another advantage is the fact that the entire thigh may be kept exposed and accessible



for dressing and inspection. In addition, this method is a comfortable means of extension.

Special emphasis is laid upon the necessity for early mobilization of the knee-joint. Following the use of Buck's extension, knee-joint disability is relatively common. Caliper extension permits constant daily mobilization which is painless.

As an adjunct to the treatment the fracture frame suggested by Richter may be used. This frame, a modification of the Bradford frame, makes the patient independent of his bed. It readily permits frequent X-ray examination without disturbing the fracture.

The large size of the thigh makes primary closure an unsafe procedure in most gun-shot fractures. Chemical sterilization with free drainage to prevent phlegmon during the septic stage is regarded as imperative.

The common complications, suppurative knee- and hip-joint involvement, and secondary hæmorrhage must be promptly dealt with because they are the chief causes of death in these cases.

J. R. BUCHBINDER.

**Hessert, W.: Ununited Fractures of the Neck of the Femur; Treatment by Bone Transplantation.**  
*Surg. Clin. Chicago*, 1919, iii, 399.

The patient, aged 40, was injured by falling on a slippery sidewalk and landing on his hip. The injury was immediately disabling and he was bed-ridden for six weeks. A diagnosis of fracture was not made and nothing was done for him in the way of treatment. After six weeks he went about on crutches. He was repeatedly assured that he had no fracture. When the author saw him he was unable to walk except with the aid of crutches and was suffering a great deal of pain in the right hip and knee. There were  $1\frac{1}{2}$  inches of shortening, eversion of the foot, and functional disability.

The X-ray picture showed a fracture of the neck of the femur which probably at the time it was sustained was of the base of the neck and not sub-capitellar. During the last two months considerable absorption of the neck had taken place so that at the time of this examination there was an osteoporosis of the head and neck, a non-union with considerable absorption of the neck of the femur. The trochanter had slipped in an upward direction until its upper margin lay almost opposite the upper edge of the acetabulum.

The indication for operation was the non-union, and the only procedure applicable was the use of an autogenous bone graft, a peg made and driven into the previously prepared hip. Hessert has abandoned the use of all metallic splints, screws, nails, and spikes because it has been shown by experience that a foreign body of metal is not conducive to good bony union.

An incision was made on the inner side of the sartorius and the capsule of the hip-joint exposed by holding the sartorius to the outer side. The capsule was opened and the fracture exposed. Interposed

between the fragments were pieces of membrane and fibrous tissue which were removed and the ends of the bone freshened sufficiently so that traction and adduction could be made. The eversion was corrected. An incision was then made over the trochanter, and after the periosteum was incised a hole was drilled about  $1\frac{1}{4}$  inches below the upper margin of the greater trochanter. The position of the drill hole is most important. It should be so placed that when it passes through the upper end of the femur through the trochanter it will strike the neck and go into the head.

The bone graft was secured by making an elliptical incision over the tibia and arranging the flap so that the incision did not lie directly over the denuded bone. The periosteum was incised at the crest of the tibia and scraped back because if fibrous tissue were left adherent to the bone it would cover up the osteoblasts and prevent union of the graft. The graft was 3 inches long and tapered a little at the end. After it was driven into place in the drill hole the wound was closed, the soft parts with catgut and the skin with silkworm. A plaster of Paris spica was then put on with the leg in abduction. This was left on for six weeks, at the end of which time it was replaced by a new one. The patient was not allowed to bear weight on the leg for from four to six months, but was permitted to be about on crutches. Six months after the operation he was able to walk without a limp, and motion at the hip was 90 per cent restored and not painful. No shortening was demonstrable and there was no eversion of the foot. The patient was able to climb stairs easily. The tibia from which the graft was taken caused no trouble at any time.

P. H. KREUSCHER.

## SURGERY OF THE BONES, JOINTS, ETC.

**Chaffee, G.: Leading Up to Modern Operative Bone Surgery.** *Am. J. Surg.*, 1919, xxxiii, 63.

Until a very few years ago, except in cases of non-union and fractures of the patella and olecranon, the surgeon rarely operated upon a fracture and when he did the results were often far from satisfactory. Silver wire used in such cases for many years yielded its place to kangaroo tendon. For several years the late John B. Murphy used phosphor-bronze wire.

Lewis S. Pilcher brought out the true pathology of the Colles fracture and the correct and easy way of effecting its reduction without causing unnecessary trauma and without recourse to the open operation. Nicholas Senn devised the use of decalcified bone chips which, however, were used only for a time. The late A. M. Phelps endeavored to graft a portion of bone supported by the nutrient artery from the leg of a dog into the leg of a boy but met with failure.

The accidental discovery of the X-ray, its application to the diagnosis of fractures, and its aid in



suggesting to the surgeon the correct line of procedure in all bone lesions, marks the most important era to date in bone surgery the world over. Formerly the surgeon was interested only in apposition and alignment. Of late, however, he watches the changes at different stages of bone formation and follows them to the end-result. The X-ray has helped also to guide and direct the surgeon in correcting the poor end-results of former methods.

Geiger, Albee, and Harley saw the need for more complete and modern bone instruments and each has devised a complete set which is driven by motor power.

The late John B. Murphy attracted the attention and admiration of the medical profession by his wonderful bone and joint surgery. Lane of London deserves great credit for his pioneer work in establishing the open method of treating fractures and for the perfect operative technique he developed. Geiger, Albee, Crile, the Sharp brothers, the Mayo brothers and many others have been supporters of the open operative treatment. There is a difference of opinion, however, as to whether fractures of the long bones should be treated by the non-operative method or by the modern open method. Some believe that the open method should not be used until it has been found that the closed method is not satisfactory. The time to settle the question of operative or non-operative treatment of the broken bone is as soon as possible after the accident causing the fracture. This can be done with the aid of the X-ray and consultation with an expert bone surgeon.

The author believes that to obtain the best end-results all fractures of the long bones should be treated in the hospital as the patient is then under the constant observation of the surgeon or his assistant. Modern methods of transportation make this possible. In all such cases the family physician who applies first aid and sends the patient to the hospital should be paid a fee commensurate with the valuable services he has performed and the responsibility he has assumed.

E. A. PRINTY.

**Foote, E. M.: Bone Grafts.** *U. S. Nav. M. Bull.*, 1919, xiii, 433.

Bone grafting has reached practical importance because of the necessity of supplying bone deficiencies due to injuries by projectiles and infection during the war. The cases reported here were those of healthy United States marines with war wounds.

Grafting, whether performed on plants or animals, is an operation full of mystery, and it is hard to understand why bone grafts live while other tissue grafts die. Bone grafting resembles the grafting of plants or trees which requires certain conditions to insure success. For the latter such conditions are: (1) a time of year in which growth is most active; (2) the avoidance of severe trauma; (3) accurate approximation of the growing layers;

(4) moisture and absence of the agents of decay; and (5) immobility of the graft.

The corresponding conditions necessary for successful bone grafting are:

1. A sufficiently good condition of the patient to develop new tissue.

2. The avoidance of undue trauma. Trauma is lessened by cutting the slots in the broken bone first.

3. Accurate approximation of the graft to the slot. Albee secures this by marking out the slot and graft with the double rotary electric saws and beveling the sides by means of the single rotary saw. The graft is then pressed into the slot until it is firm and wedged there with bone pegs, a process which requires expert mechanical ability and considerable time. The author secures a perfect fit by cutting the slot with the double saw and then cutting the graft to fit the slot exactly by using washers which are equal to the width of the saws combined. Upon observation it was found that the tight pressure thus secured is not a handicap to the growth of the graft but results in a much stronger union from the start and reduces the amount of new bone that must be formed.

4. Undue evaporation of moisture. Evaporation is prevented by the close approximation of the skin and tissues overlying the graft. The author, however, has seen suppurating cases in which the graft lived. He cites in particular one case in which in spite of superficial sloughing of the skin and soft parts, two rib grafts lived which were inserted into a wound of the skull which was trephined in France.

5. Immobility of the graft. The graft must be immobile in order that it may become firmly attached. When the fragments are in good position and alignment it is not so hard to immobilize them but otherwise it is difficult.

The sliding graft of Albee has its drawbacks as the bone is weakened by the upper or long end of the cut, the slide does not exactly fit the slot, the graft itself is not so healthy nor strong as one cut from a sound bone, and the fitting of the graft is technically very difficult if the bone ends are not exactly in line. A case is cited of non-union when a sliding graft was employed. The grafting operation is not difficult when a rotary saw is used and the technique can be developed by practising upon a basswood splint. Only the saw need be sterile. The two slots in the fractured fragments must be exactly in line and the graft must not be used to pry them into position. If the graft is firmly inserted a few sutures of chromic catgut will hold it in place. The skin and overlying soft parts are also sutured and the limb should be bandaged so as to include the joints above and below the injury. The bandage should not be disturbed for two weeks unless indicated.

The complications must be guarded against. Slight suppuration may disappear but severe suppuration requires the removal of the graft. Fracture



of the graft may not necessarily cause non-union. Loosening of one end may be due to poor fitting of the graft, bad alignment of the slots, or suppuration.

Foreign bodies if not infected may have no effect upon the graft, which will grow in spite of their presence.

In the selection of a bone for the graft the author recommends the consideration of the ribs which are tough, durable, have greater vascularity, and regenerate rapidly. M. H. HOBART.

**Bernstein, M. A.: The Surgery of Tendon Transposition, with Special Reference to the Importance of the Tendon Sheath.** *Surg., Gynec. & Obst.*, 1919, xxix, 55.

Bernstein reviews the literature of tendon surgery since Nicoladini in 1880 made the first tendon transposition in the treatment of infantile paralysis. The early methods of Lange and Drobnick and their followers are discussed as well as the more recent technique recommended by Biesalski and Mayer.

The finer anatomy of the peritendinous structures is described in detail. It is shown that in surgical transposition the methods of anastomosis of Lange and others and the more recent method of transposing a healthy tendon through the sheath of a paralyzed tendon, while valuable and practicable from a surgical point of view, do not succeed in giving a thoroughly satisfactory functional result. The occurrence of dense adhesions about the transposed tendon is one of the chief factors resulting from the operation which tend to make it a functional failure.

The consideration of the clinical experiences and experimental findings of a number of surgeons shows clearly that the function of a surgically transposed tendon separated from its normal surrounding structures is lessened by disturbances in its nutrition, by mechanical interference with its movements, and by a change in the nature of the regenerated tissue. Therefore the true physiological method of transposing a tendon so that its function is transferred to its new insertion is to transpose also all the necessary peritendinous structures with the minimum amount of surgical traumatism.

Bernstein has carried out a number of experiments on animals having for their object the histologic investigation of the results of other methods of transposition and also the results when a tendon is transposed with its sheath and all its peritendinous structures. In the latter case the sheath was not opened and special fixation sutures devised by the author were employed at the point where the tendon was to be cut.

Histologic examination of specimens removed after the various experiments showed that following the older methods there was marked infiltration into the tendon substance proper and its surrounding structures, with some signs of degeneration. In

the experimental transposition of a tendon drawn through the sheath of another, the sheath wall proliferated markedly and there were fibrinous adhesions. In the author's transposition of a tendon with the sheath and the peritendinous structures, the specimens showed the tendon unchanged and in spite of some infection around the transposed tissue the sheath wall had not ruptured. The most important finding in the sections was the absence of all inflammatory processes between the tendon and the sheath so that there was no opportunity for the occurrence of adhesions. There was no mechanical interference with the functioning of the transposed tendon and no sign of fibrosis of the tendon. Bernstein therefore claims that the method of transposing in which the normal anatomical surroundings of the tendon are preserved is the true physiological method.

**Willems, C.: The Treatment of Purulent Arthritis by Wide Arthrotomy Followed by Immediate Active Mobilization.** *Surg., Gynec. & Obst.*, 1919, xxviii, 546.

Contrary to the old idea of the necessity for immobilization in practically all cases of joint lesions, the author has for some years applied the principle of immediate active mobilization to a great variety of lesions in the joints, both infective and non-infective. The technique is practically the same for all types of cases. In cases of recent injuries it includes excision of the damaged soft parts, sequestrotomy of the fracture area, extraction of projectiles, and tight closure of the joint. In purulent arthritis the joint is left wide open. Immediate active motion is begun if possible and continued under personal supervision. The degree of active mobility depends on the extent of the lesion and the aptitude of the patient in directing his attention to the use of the proper muscles.

When an extensive fracture precludes active use of the joint, passive motion must suffice. The movements are not painful unless accompanied by displacement of fragments, but are laborious and require effort. The amount of pain is usually inversely proportional to the degree of motion. In purulent joints opened wide by bilateral incisions the pus is squeezed out of the recesses by extreme flexion and extension. This gradually decreases in amount, the tissues cicatrize, and small fistulae form which must be frequently opened. In consequence of the complete drainage the infection remains limited to the synovia, the peri-articular tissues remain supple, and the muscles about the joint preserve their tone. Complete range of motion practically always results. In the earlier cases a slight stiffness was sometimes noted at the time the suppuration markedly diminished. Therefore partial closure of the arthrotomy wound has been done at this stage, an opening only sufficient for drainage being left. Mobility is thus perfectly preserved.

The author gives the details of nine cases of infected joints treated in the manner described,



illustrating by photographs the positions of the limbs during active mobilization. E. M. MILLER.

**Leriche, R.: The End-Results of Subcapsular Periosteal Resection of the Elbow for Suppurative Arthritis after War Wounds** (Résultats éloignés de la résection souscapsulo-périostée du coude pour ostéo-arthrite suppurée après blessures de guerre). *Presse méd.*, Par., 1919, xxvii, 317.

Leriche has reviewed 12 of his cases of suppurative osteo-arthritis of the elbow which were operated upon during the febrile stage. The most recent of this series dates back twenty-eight months, the oldest about four years. All of these cases were operated upon according to the Ollier subcapsular periosteal technique, the resection being total. Postoperative infection was observed in only one case. Mechanotherapy was not used, but electrical stimulation and heliotherapy were employed to some extent.

As regards the functional results, neither ankylosis nor a loose joint are to be observed in any case. The functional result in all is good and in some excellent. Pronation and supination are almost complete and in the worst cases two-thirds normal. Passive extension is complete in all, but active flexion varies. As regards the anatomical results, it is stated that all except one patient have had articular regeneration. In the different cases, however, this regeneration has been of various types, which the author illustrates by schematic drawings. In 2 cases it approached the normal. When the regeneration in suppurative cases is compared with that in cases of primary resection evolving aseptically it is observed that the latter is more regular and conforms better to the anatomical type.

Leriche concludes from his study that the results of resection of the elbow during the febrile stage according to Ollier's technique are remarkable from every point of view. However, to obtain satisfactory functioning long patience is necessary on the part of both the surgeon and the patient.

W. A. BRENNAN.

**Bessesen, A. N.: The Treatment of Colles' Fracture.** *Am. J. Surg.*, 1919, xxxiii, 147.

Fracture of the radius at the wrist-joint occurs so frequently that every physician should be thoroughly acquainted with the correct diagnosis and proper treatment of a Colles fracture.

Robert Jones advocates the following method to reduce such a fracture of the left wrist: "The surgeon takes the patient's arm in his left hand, with his own scaphoid tubercle against the projecting lower end of the shaft. He then places his right hand on the dorsum of the patient's wrist with his own scaphoid on the projecting lower fragment. A firm grip with a slight traction and twist of the wrist completely reduces the deformity."

To prevent recurrence of deformity place a pad of wool on the upper fragment just above the site of the fracture and on the dorsum of the wrist-

joint and styloid process to prevent it from rotating backward and outward. These may then be retained with splints. The text-book method is performed by grasping the patient's hand as if to shake hands, at the same time grasping his forearm just above the wrist and placing the thumb over the displaced fragment. The patient's hand is then drawn backward into hyperextension, and while pressure is exerted on the posterior surface of the lower fragment with the thumb of the hand grasping the arm, the hand is suddenly brought forward into flexion, the ulna being used as a pivot while the hand is rotated into pronation.

When properly reduced, the normal concavity on the anterior surface of the radius is restored, the styloid process of the radius is brought into position slightly lower than the styloid process of the ulna, and the fractured wrist is made to look as nearly like the other as possible, with all the landmarks in their normal relation.

The best method of fixation is to use an adequate splint. Casts should be avoided because of the danger of constriction and interference with frequent inspection. Some form of support should be retained for at least six weeks as the patient assumes that he has completely recovered when the dressings are removed.

The writer submits an auxiliary splint to be used after removal of the stronger fixation splints, such as the old-fashioned anterior posterior padded splints or the more modern molded splints, the Jones' metal spival, the Bond splint, the Gordon pistol-shaped splint, or the Walker papier maché splints. This type of auxiliary splint, which appears to be a modification of the Jones' short-arm splint, is simple in construction, being made of aluminum strips and leather straps fastened together at each intersection by a single rivet to permit easy adjustment. It is intended to be worn for from two to three weeks' time and then discarded for an ordinary wrist-strap.

P. H. KREUSCHER.

**Pratt, R. B., and Park, J. F.: Resection of the Head of the Femur in Certain Gunshot Wounds of the Hip Region.** *Mil. Surgeon*, 1919, xlv, 16.

The hip-joint, including as it does the head of the femur, the upper fifth of the femur, the neighboring pelvic bones, the pelvic contents, and the great mass of musculotendinous and fascial tissues in this area, is as replete with serious and complicated problems as any approachable region of the body.

Two cases of serious gunshot wounds of the hip which involved the head of the femur and acetabulum are cited. Both were closely parallel in their course, complications, and indications for treatment, and in the authors' opinion constitute valuable contributions in support of the surgical principles to be considered in all cases of pyogenic infections of this joint.

The first case was that of a patient who sustained severe, multiple, penetrating gunshot wounds (shrapnel) in the left side of the abdomen, the left



hip, and the left foot. Débridement and secondary closure were done at an evacuation hospital five days later.

Two months after the injury the patient was admitted to Base Hospital No. 216 in a serious condition. The abdominal wound had healed, but a sacral bed-sore about 3 inches in diameter and a pressure ulcer from a Thomas splint were found over the left ischial spine. A Thomas splint was in position on the left leg, but owing to the ischial sore was ineffective. About the hip were multiple sinuses bordered by oedematous, unhealthy scar tissue and exuding large amounts of pus containing non-hæmolytic streptococci and staphylococci. No anaerobic organisms were found. There was wasting of the buttock with atrophy of the entire limb. The condition of the skin was poor.

X-ray examination showed a compound, comminuted fracture of the head of the femur and acetabulum with an infectious destructive process and new bone formation not only at the joint but in the muscle mass some distance away. There was some atrophy of the femoral shaft.

The patient was given general treatment and Dakin's fluid was used to lessen the infection about the hip. This, however, was without notable result. A month after admission one scar with its sinus was excised and fragments of bone were removed. No attempt was made at fixation of the bones by other means than sandbags. During the operation a transfusion of 600 cubic centimeters of citrated blood was given.

Within a few days the patient's condition began to improve. Carrel-Dakin treatment was instituted on the fourth day after operation. In about two weeks the pressure ulcers were healed and fixation of the trunk and both lower extremities (the left in abduction) was gained by the application of a plaster cast. From then on, progress was rapid. Two months after operation the patient was evacuated to the United States with his wound practically healed.

To facilitate the dressing of his wounds this patient was anæsthetized about 20 times by Savari-aud's method, the anæsthesia lasting for about six to eight minutes.

The second patient sustained a penetrating and perforating machine-gun bullet wound in the left hip region and received first aid. Five days later he had a severe infection which was diagnosed as pyæmia, with abscesses of the right hip and left hip, the shoulder, and the sacrum. The abscesses were opened, after which drainage was instituted and Dakin's treatment applied.

Three and one-half months after the injury the patient was admitted to Base Hospital No. 216 in a serious general condition. There was a severe infection of the hip-joint with free discharge of pus containing non-hæmolytic streptococci and staphylococci but without anaerobes. Numerous pressure sores were present. X-ray examination showed that the infectious destructive process involved the

head of the femur and acetabulum and that the latter had a comminuted fracture.

General treatment and careful nursing did not yield any definite result except in the condition of the skin lesion. Three days after admission the sinuses were excised, bone fragments removed, and the femoral head and neck resected. Also in this case a blood transfusion was given during the operation. A plaster cast was then applied which included the trunk, the pelvis, and both lower extremities, the left leg being in abduction. Three days later it was necessary to remove the cast and no other means of fixation was attempted.

The patient made some improvement after operation, but inability to fix the limb gave endless trouble. Because of the flail joint it was difficult to prevent pocketing at the site of operation. A collection of pus formed on the outer side of the calf just below the knee and required drainage. The bed-sores healed slowly. Because of the failure to improve the hip condition, it was decided to amputate, which was done six weeks after the first operation.

Following amputation the bed-sores healed completely as did also the hip region except for a small, clean, granulating area along the line of incision. Six weeks after the amputation the patient was ready for evacuation to the United States.

These two cases emphasize the following surgical principles.

1. Penetrating and perforating infected wounds are complicated by the spread of infection along many unrestricted paths which follow no such well-defined course as do some of the hæmatogenous or lymphogenous infections of this area, and cannot be drained by any single incision.

2. Chronic pyogenic processes involving both the head of the femur and the acetabulum cannot be properly drained except by resection of the femoral head.

3. Whenever resection is done, the acetabulum should be thoroughly explored, and if necrotic, should be sufficiently removed to furnish ample drainage from its internal surface.

4. Even when performed by only moderately experienced surgeons resection is a brief operation and eliminates the severe shock involved in hip-joint amputation.

5. Resection alone, however, is attended with certain shock, and this should be combated with the prophylactic transfusion of citrated blood during the operation.

6. Removal of the head is facilitated by first separating it from the shaft by a Gigli saw (the easiest and most rapid method) and by clearing its trochanteric and posterior surface first.

7. Completion of the hip-joint amputation subsequent to resection is simple and can be done rapidly. In no way is it comparable in severity to the formidable operation as a whole.

8. When comminution of the head is extensive and associated with considerable separation of the



fragments and sinuses leading to the skin surface, drainage is correspondingly greater, and in parallel cases microscopic examination will show less acute changes.

o. Extensive, diffuse, new, and unhealthy bone deposits occur in and about an infected joint which is improperly drained and without physiological rest. Therefore proper drainage and fixation are absolutely necessary.

ro. The use of Dakin's fluid is of no value whatever unless the wound is first properly prepared surgically following Carrel's injunction.

G. W. HOCHREIN.

**Lounsbury, B. F.: Plastic Repair of the Heel.** *Surg. Clin. Chicago*, 1919, iii, 553.

Three unusual cases of injury in which the soft parts of the heel were torn away and the calcaneus tip was either crushed or lacerated, resulting in a persistent ulceration in a thick scar, presented problems in repair.

In his first case the author brought the heel to the back of the opposite thigh, making a flap and maintaining the position by a cast for fourteen days. He obtained a perfect result but the position used necessitated a face position which was uncomfortable to the patient and troublesome to the attendants.

In his second case therefore he brought the injured heel to the front of the opposite thigh. This resulted in a pressure necrosis through the quadriceps to the femur and through the skin of the external malleolus. The end-result, however, was good though delayed.

The third case was similarly managed but although great care was taken to relieve the pressure of the foot on the thigh, necrosis resulted and delayed an otherwise perfect result.

K. L. VEHE.

## ORTHOPEDICS IN GENERAL

**Lowman, C. L.: A Suggestion in Regard to Amputation Cases.** *Mil. Surgeon*, 1919, xlv, 617.

In a study of balance-board exercises with reference to faulty statics it was concluded that in cases of relaxed posture and weak feet the Swedish balance-board exercises are harmful. The best agent for the repair of weak structure is active exercise in proper dosage and with the foot in the corrected position. It is an axiom of orthopedics that not only should weakened structures be strengthened, but deforming forces should be rendered ineffective. To correct the condition of faulty statics in flat-foot due to relaxed structures on the inner side and shortened structures on the outer side of the foot, balance exercises are of value provided the foot is not carried inward under the midline of the body as with the Swedish balance-board.

The secondary deformities in unilateral foot and leg cases are often overlooked until definite injury is done. Frequently flat-foot is produced in one foot

when the other leg has been paralyzed or injured. It was observed that in one of the Canadian reconstruction hospitals practically all of the patients who had had leg amputations and were awaiting artificial limbs used the good foot in a marked position of valgus like that of a person standing on a Swedish balance-board. Such a position leads to shortening of the peronei and outer leg structures and if long continued results in a deformed arch. In walking the condition is increased by the outward thrust of the pelvis over the weight-bearing leg, which increases both the lateral and rotation strain that must be borne by all the leg structures, especially the joint linings of the hip, knee, and ankle. To prevent this condition prophylactic use of the tilted heel with a raised inner border is advocated, in conjunction with the following foot exercises:

1. Rotation of the thigh outward with the toes gripping the ground. If the foot is already flat, this is done while the patient is lying in the prone position and the foot is held by an assistant.

2. With the patient seated, the foot is strongly abducted and dorsiflexed, the toes being plantar-flexed.

3. Toe gripping exercises. E. M. MILLER.

**Putti, V.: The Utilization of the Muscles of a Stump to Actuate Artificial Limbs; Cinematic Amputations.** *Med. Rec.*, 1919, xcv, 1004.

By the cinematization of a stump is meant any kind of surgical proceeding which helps to make possible the direct transmission of voluntary movement from the stump to the artificial limb.

This is obtained by the formation on the stumps of artificial points of attachment, so-called "plastic motors," to which are fastened the cords or extensors destined to transmit the movements. Cinematization can be effected or prepared at the time the primary amputation is performed; it can be done also upon stumps which have already healed.

Plastic motors may vary as to their number, position, shape, and function.

To fulfill the purpose for which it is made, a plastic motor must possess every requisite for withstanding a firm, resisting, and painless grip, and also a traction force which in not a few instances may be high. It must be provided also with a sufficient amount of muscle masses capable of functional movement.

The primary conditions for obtaining the first requisite are:

1. The motors must be covered with skin in perfect condition, well nourished, and possessing a normal degree of sensibility.

2. The motor must be of a size suitable for the fastening of the hooks, rings, and rods that are destined to transmit the functional movements to the artificial limb.

The author had an opportunity to study cinematic prosthesis at the Institute Rizzoli where he had at his disposal a large workshop for the construction of



artificial limbs. As a result of his research at the Institute, he concludes as follows:

1. The practical results that have been obtained through cinematization have indicated that the hopes aroused by the principles and methods of the modern surgery of plastic motors are thoroughly well grounded. Cinematic plastics are entitled to a place among the most brilliant discoveries of orthopedic surgery and should be accepted with perfect confidence and tested on a large scale by all whose aim it is to restore functional activity to those who are disabled.

2. The preparation of plastic motors is a well-defined surgical act that must be performed in

accordance with its own special methods. The latter have already stood the test of experience.

3. From the view of physiology it has been proved that plastic motors are capable of giving both the quality and quantity of action which can be given by the muscle masses that stimulate them. However, practically considered, plastic motors will yield the full measure of their value only if the artificial limb is perfectly adapted to their shape and their strength.

4. As the principal aim of cinematization is to obtain the vitalization of the artificial limb, it is essential that the surgeon and the artificial limb maker should work in harmony. E. C. ROBITSEK.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Riba, J. de: The Results of the Treatment of Pott's Disease by Osteoplastic Fixation of the Spinous Processes — the Albee Operation** (Tratamiento del mal de Pott por la fijación osteoplástica de las apófisis espinosas — operación de Albee. Resultados personales). *Rev. españ. de cirug.*, 1919, 1, 241.

The treatment of Pott's disease is based upon immobilization of the affected region and on physiotherapy (heliotherapy, baths, etc.) which, by improving the general condition, help in the struggle against the infection.

The Albee operation, which wonderfully fulfils the first of these requirements, is easily executed and accomplishes perfectly the effects obtained by successive years of plaster-cast treatment. Moreover, it is not dangerous as it is performed in healthy tissue and without injury to the nerves. On the other hand, it has the advantage of increasing the strength of the vertebral column. This operation may be done at any age, in all parts of the column, and in all stages of the disease. The regions most favorable, however, are the lower dorsal and the lumbar regions. The best time for the operation is the incipient stage of the disease, as soon as diagnosis is made. Paralysis is not a contra-indication; on the contrary, it is favorably affected by such treatment.

The author's statistics comprise 14 cases in which results highly satisfactory from all points of view were obtained by the Albee method.

W. A. BRENNAN.

**Girdlestone, G. R.: A Note on Pott's Disease and Albee's Spinal Graft.** *J. Orthop. Surg.*, 1919, xvii, 401.

Fifty consecutive cases of Pott's disease treated by Albee's operation are recorded.

The diagnosis of this condition is based on the usual symptoms, special attention being paid to the presence of muscular spasm resisting movement in all directions and the X-ray findings.

The purpose of the operation is to secure immobility of the affected vertebræ by an auto-

plastic graft from the tibia. If the spinous processes are fixed and the lateral articulations are sound, no movement of the bodies can take place.

The vertebral column is normally held in place only by the muscles. Albee's operation is valuable in that it tends to give: (1) permanent immobility in the corrected position; (2) a greatly reduced period of confinement to bed; and (3) a safeguard against recrudescence of the disease. It should not be performed, however, upon children less than 3 years of age nor upon very old persons. Neither is it of value in the treatment of the atlanto-joint. Active cases should not be operated upon until the activity of the disease process has been abated by immobilization on a frame. Sepsis or discharging sinuses about the field of operation are also contra-indications. "Cold abscesses" are not opened by the operation.

Pre-operative treatment is begun immediately upon the detection of active Pott's disease and consists of: (1) splinting with a frame or cast to give complete rest; (2) reduction of reducible deformity very gradually when indicated; and (3) general treatment.

The author gives an exhaustive description of methods of splinting for different regions of the spine.

The Albee operation should be performed in a warm operating room and the surgeon should avoid hammering. The anæsthetic given should be ether, not chloroform. Great care should be used to prevent any movement of the spine.

The postoperative treatment includes, first, the immediate treatment of shock. The first dressing should be done from four to ten days after the operation as indicated. The patient should be turned weekly in order to change the pads. The time at which the frame should be removed depends upon the location of the disease and other conditions, but is usually at the end of three months. The patient should then remain in bed for another month before sitting up. Soon thereafter he is able to walk but should wear the frame for a year.



A table of cases is followed by a discussion in which it is stated that gunshot fractures of the spine may also be treated by this method.

While by some surgeons it is questioned whether the Albee operation saves time and is sufficiently safe to be used in place of the conservative methods of obtaining fixation, others claim that it is both safe and simple, saves time, and is absolutely indicated in the cases of adults and when other methods have failed.

M. H. HOBART.

**Arquellada, A. M.: Personal Experiences in the Operative Treatment of Pott's Disease** (Mi experiencia personal en el tratamiento cruento del mal vertebral de Pott). *Pediat. espan.*, 1919, viii, 165.

The author has operated upon 46 cases of Pott's disease, 43 according to the method of Hibbs with the slight modifications suggested by Lugones, and 3 by the Albee technique. The Hibbs method he considers much more simple and shorter than the Albee method.

There was one death which occurred three days after operation and was due to meningitis. In this case an abscess not revealed by radiography was opened during the operation. Of the other 42 patients operated upon by the Hibbs method, 8 could not be traced. In 6 cases the results were the same as those obtained by the use of a plaster cast alone. In the others recovery was complete. However, it is still too soon to warrant the assumption that the cure in these cases is definite as the

earliest operation was performed only three years ago and some of them very recently.

An important fact to which the author desires to call attention is that in applying the Hibbs' method the deformity does not completely disappear and in some cases does not even diminish. In all cases the postoperative course was normal except that in 3 one of the apophyses operated upon was eliminated as a sequestrum.

The Hibbs method is indicated particularly in: (1) early cases with angular deformity, and (2) cases in which the vertebral lesions are associated with paraplegia.

The ages of the patients in the series reported varied from 2 to 12 years. The majority were at least 7 years old.

In one of the cases operated upon by the Albee method the tibial graft did not take. In the others it was implanted successfully but in these instances the author states that he is unable to deduce anything of value from the clinical or operative viewpoints.

As a general conclusion it is stated that no concrete deduction with regard to Pott's disease can be drawn from the operative methods. It is necessary to compare the results obtained in many series of cases and after a long period of time by different procedures, both operative and non-operative, including heliotherapy, before precise and definite conclusions can be drawn as to the value of, and indications for, any particular method of treatment.

W. A. BRENNAN.

## SURGERY OF THE NERVOUS SYSTEM

**Cestan: The Late Results of Nerve Suture** (Resultats tardifs de suture nerveuse). *Rev. neurol.*, 1919, xxv, 149.

The author made clinical and electrical examinations of a number of wounded soldiers who had undergone nerve operations at least two years previously. As controls, he examined a number of men who had received injuries of the peripheral nerves at the same time but had not been operated upon.

There were 23 cases in which a nerve suture had been done under the best conditions for the patient. Eleven of these were sutures of the radial nerve in the middle part of the arm, 6 sutures of the cubital nerve, 2 sutures of the median nerve, and 4 sutures of the sciatic nerve at the posterior part of the thigh.

The 11 sutures of the radial nerve gave 2 failures and 9 positive results. In 2 of the latter cases there was a complete return of mobility but some muscular atrophy and hypæsthesia in the region of the nerve. The other positive results were less satisfactory.

The 6 sutures of the cubital nerve gave 3 good results and 3 that were only fairly good.

The 2 sutures of the median nerve gave negative functional results.

The 4 cases of suture of the sciatic nerve gave 1

very good result, 2 that were only fairly good, and 1 failure.

The author believes that time is the most important factor in operations upon the nerves, the success of surgical treatment depending upon performing the operation soon after the injury. In his investigations on this point he found that in 5 cases of primary suture of the same nerves the results were successful in 80 per cent, in 14 cases of suture done in the first five months after the injury there were 13 very good or medium results and 1 failure, while in 4 cases of nerve suture done a year or so after the injury the operation was a failure in all.

Operations performed even under the most ideal conditions for the patient later than the fifth month after injury give either no results or results that are mediocre. The ideal is primary suture or at least suture done within a few weeks after the injury. It is then possible to perform it before the development of a neuroma, resection will not have to be as extensive, and the re-union of the ends is more easily effected. It should be borne in mind also that the results of nerve surgery are good only when the operation is followed by a long and methodical course of physical treatment.

W. A. BRENNAN.



## MISCELLANEOUS

**CLINICAL ENTITIES—TUMORS, ULCERS, ABSCESSES, ETC.**

**Lurie, W. A.: Delayed Infection or Irritation and Concomitant Metabolic Errors.** *Boston M. & S. J.*, 1919, clxxi, 1.

As a rule delayed infection is not recognized until it has developed to the point termed focal infection. Delayed infection produces serious metabolic errors by altering the function of the various so-called ductless glands. A lowering of the resistance of the body opens the way to greater activity for such delayed infections and therefore the eradication of the infectious focus, long dormant, must be effected before normal metabolism can be re-established. Prime among the sources of delayed infection is the extraction of teeth without the resection of alveolar tissue. This permits the development of dead space which remains infected.

The errors of metabolism may result from toxic substances not necessarily of bacterial origin. Long-continued irritation, infection, or altered function produce pathologic conditions and the treatment of the symptoms of such conditions, rather than of the exciting cause of the metabolic error, leads only to further delay in the eradication of an infection which ultimately may be discovered as an established focus. Pyorrhœa alveolaris is more truly "alveolitis dentalis," or perhaps, more correctly, "alveolitis maxillo-dentalis."

M. N. FEDERSPIEL.

**King, J. H.: Gastro-Intestinal Disturbances in Metabolic Diseases and Diseases of the Ductless Glands.** *Med. Clin. N. Am.* 1919, ii, 1655.

The only disturbance of the gastro-intestinal tract which is associated with diseases either of metabolism or of the ductless glands and which might be considered specific, is the diarrhœa of hyperthyroidism. There are, however, a number of derangements of some diagnostic and prognostic importance which will be clearer to the clinician when the etiological chain and the pathological relationships of these obscure diseases are better understood. The writer enumerates the various gastro-intestinal disturbances which occur in diabetes, gout, obesity, Addison's disease, and diseases of the thyroid, pancreas, parathyroid, pituitary, thymus, and pineal glands.

W. H. NADLER.

**Dunet, C.: The Treatment of Hæmorrhagic Shock by Intravenous Injections of Physiologic Salt Solution at 55 Degrees Centigrade** (Traitement du shock hémorragique par les injections intraveineuses de sérum à 55°). *Presse méd.*, Par., 1919, xxvii, 323.

In the preliminary treatment of shock the author believes it more logical that the patient should be

warmed from within rather than from without. Both experimentally and clinically he has tried the effect of injecting in hæmorrhagic cases isotonic salt solution the temperature of which varied from 55 to 80 degrees centigrade. While the experiments made so far are only preliminary, the results obtained, added to the clinical data, seem to justify the following conclusions:

1. It is possible to inject into the blood-stream, without fear of accident, fluids the temperature of which is much higher than that of the body. The limits of toleration seem to lie between 70 and 80 degrees centigrade, the exact figure varying with the area into which the injection is made.

2. A temperature of 55 degrees centigrade, which is well below the highest which can be borne by the organism, does not cause any destruction of tissue and for this reason seems to be the ideal temperature.

3. Following a severe hæmorrhage, the patient has a serious loss of heat in addition to the blood loss.

4. The classical treatment consists in re-establishing the volume of blood by intravenous injections of blood or serum. To supply the heat loss, external methods of heating alone have been relied upon, but the use of the blood-stream to re-establish the heat balance is more logical as it allows rapid diffusion with the least loss of warmth.

5. The intravenous injection of physiologic salt solution at a temperature which is non-injurious to the organism (55 degrees centigrade) fulfils all therapeutic ends as it re-establishes the blood-volume at the same time that it re-establishes the heat balance.

Clinical cases of shock treated by such injections yielded very favorable results. In the last case so treated by the author 2 liters of saline solution heated to 55 degrees centigrade were injected intravenously in the neck region. The extremities became warm very rapidly and the patient was placed in her bed in such a satisfactory condition that on the following day it was possible to perform a double amputation.

W. A. BRENNAN.

**Bercovitz, N.: Cancer in Hainan, China. A Preliminary Statistical Study of 131 Operations, with Special Reference to Age Incidence, Anatomical Distribution, and Etiology.** *J. Cancer Research*, 1919, iv, 229.

Cancer as observed by the author in Hainan presents a number of phases which differ somewhat from those usually observed. These phases include the early age incidence of the disease, an unusual anatomical distribution, and a difference in the causes commonly considered as predisposing.

In the study of these statistics the medical conditions peculiar to China must be remembered, viz., the gradual turning of the people to western medi-



cine, the fact that many patients who come to the hospital are inoperable and come only after all native remedies have failed, and finally, the fact that until very recently prejudice has kept the women of China away from medical and surgical aid. For these reasons it may be assumed that the statistics of the next few years will differ somewhat from the present figures.

The cases were operated upon by the author in Hoi How and Kacheek and by members of the staff of the Hoi How Hospital. Lack of facilities prevented microscopic examination, to the author's great regret.

This brief statistical study of cancer in Hainan brings out the following points:

1. Cancer in Hainan is as much a disease of the early decades of life as of the later decades, and for this fact no reason can be found.

2. Cancer of the penis and glands of the neck is unusually common. For the former an old primary sore may be the etiological factor, while for the latter no cause is known.

3. Cancer of the exposed surfaces of the body is very common. Inasmuch as in most cases these people wear a scanty amount of clothing, the rays of the sun may be a contributing factor. It is more likely, however, that the causes are large ulcers which were treated in the native fashion and the sores resulting from counterirritation as practiced by the Chinese. This is all the more probable in view of the tendency to keloid formation and the universal infection of wounds.

4. Cancer of the stomach is infrequent. The absence of certain virulent streptococcal infections which are responsible for gastric ulcer may have something to do with this fact or it may be that, as in cancer of the uterus, the cases are not seen by the surgeon.

5. Cancer of the uterus is uncommon. While these cases also may not be seen by the physician, it seems rather suggestive that virulent infections of the female generative organs are likewise infrequent here.

G. E. BEILBY.

**Robinson, E. P.: Does the Cure of Cancer Depend upon the Oxidation of the Tissues?** *Med. Rec.*, 1919, xcvi, 9.

In the author's opinion the cause of cancer is the presence of an excess of sodium in the cell and the cure is dependent upon the removal of this irritant, irrespective of the means employed. His belief in this theory is strengthened by the results obtained by the use of radium, the X-rays, and actinic rays, as well as by his own success with the administration of potassium nitrate.

The reasons for attributing the cause of cancer to an excess of sodium chloride in the tissues (given in a previous article) are quoted. The excess of sodium chloride is ascribed to the common habit of using an excess of table salt with food. In another article the use of potassium nitrate in cases of cancer was recommended on the assumption that the

proper equalization of potassium and sodium constitutes health and that their displacement is interchangeable. The quantity of potassium nitrate advised was  $\frac{1}{25}$  grain dissolved in 4 ounces of water and given every four hours.

Cancer is viewed as an exaggerated phase of an original inflammation possessing no other characteristics than the presence of atypical cells in the inflamed tissue; in other words, as an inflammation of a malignant type.

An excess of sodium results in incomplete oxidation so that a certain amount of sodium crowds out the potassium, the normal element of the cell. Expelling the irritating sodium from the cell sets up local inflammation. Sodium is readily oxidized in the presence of oxygen, heat, or light. The good results reported in cancer by the use of the different forms of radium, X-ray, and actinic rays are ascribed to oxidation of the sodium which the irritated, overloaded cells are unable to expel. Oxidation appears to play an important part, if not the entire rôle, in the cure of cancer by the use of rays. The malignancy of cancerous tissue is dependent upon an element which the action of light rays in any form removes. Potassium nitrate displaces the excess of sodium from the inflamed cell and hastens tissue regeneration.

A study of changes in the sodium spectrum of cancer cells exposed to sterilization by radiation as compared with the spectrum of untreated tissues should be made preferably by workers proficient in the use of the spectroscope. Co-operation of scientists other than those of the medical profession is also desirable in cancer research.

W. H. NADLER.

**Proper, M. S., and Simpson, B. T.: Malignant Leiomyomata.** *Surg., Gynec. & Obst.*, 1919, xxix, 39.

At the pathological laboratory of the New York State Institute for the Study of Malignant Disease during the past four years there were 22 malignant leiomyomata among 357 leiomyomata. The authors define malignant leiomyomata as malignant neoplasms arising from mesoblastic cells of the smooth-muscle type. Their percentage is high because specimens of suspicious appearance are sent to them while specimens of benign tumors are not.

The majority of these neoplasms occur in the body of the uterus and most of them arise from pre-existing fibroids (16 out of 22). The gross appearance varies with the stage of progress of the malignant process. When found at the center of an old fibroid the area may present a grayish-white to reddish appearance and is soft in consistency. The large, ulcerating, protruding mass is of marrow-white appearance and the consistency of brain tissue. It resembles carcinoma. The histologic aspect varies probably with the rapidity of growth and the degree of malignancy. Histologically these tumors may be classified into three groups according to their variation from the smooth-



muscle type of cell: (1) those resembling very closely the leiomyomata; (2) those having a short, plump, spindle shape with oval nuclei; and (3) those having a marked variation in the morphology of the cells.

Pictures and minute descriptions are given of each. Twenty-two cases are reported briefly. All but one of the patients were married women. The ages varied from 32 to 72 years.

The authors emphasize the warning of Geist that the treatment of fibroids by X-ray or radium is dangerous in women past 40 years of age because if malignant change has taken place it is of no avail and valuable time may be lost.

The conclusions drawn are as follows:

1. Malignant leiomyomata are not uncommon.
2. They arise most frequently from pre-existing leiomyomata.
3. The three histologic types into which malignant leiomyomata may be divided apparently correspond to their degree of malignancy.
4. In view of the frequency of malignant change, fibroids should be removed surgically as soon as discovered.

C. R. STEINKE.

#### SERA, VACCINES, AND FERMENTS

**Bouchet, P.:** The Results Obtained with the Polyvalent Serum of Leclainche and Vallée in the Treatment of War Wounds (Résultats obtenus avec le sérum polyvalent de Leclainche et Vallée dans le traitement des blessures de guerre). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 556.

Following the use of the polyvalent serum of Leclainche and Vallée in 420 cases, traumatic shock soon subsided and operation was made possible. On the following day the wound appeared healthy. It then closed rapidly and the general condition remained good. These results were a vast improvement over those obtained prior to the use of the serum.

As a general principle the author states that if the serum is injected within six hours following the injury, gas gangrene does not develop. In cases in which it has already developed the inoculation decreases its severity.

The author has used the serum also in other conditions beside war wounds. He has obtained good results with it in chronic lymphangitis, phlebitis, erysipelas, dermatitis due to faulty cicatrization of wounds, inflamed varicose ulcerations, and actinomycosis. Chronic or subacute infections are also benefited by it.

The injection is made subcutaneously in the upper third of the thigh. As a rule the dose used is 10 cubic centimeters. The injection should be given as soon after the injury as possible. In cases of multiple wounds from 20 to 30 cubic centimeters are injected.

In severe cases and when gangrene develops the injection is renewed after two or three days, and sometimes from 20 to 30 cubic centimeters have

been given daily with very good results. Not the least anaphylaxis has been observed even after the heaviest dosage.

The polyvalent serum is not intended to take the place of the usual surgical treatment.

The employment of polyvalent serum in civil practice will find its indications in cases of traumatic shock, gangrene, septicæmia, and the infections due to industrial accidents.

W. A. BRENNAN.

#### BLOOD

**Baumann, L., Hansmann, G. H., Davis, A. C., and Stevens, F. A.:** The Uric Acid Content of the Blood Compared with the Renal Dietary Test. The Bland Diet Compared with the Ordinary Test Diet. *Arch. Int. Med.*, 1919, xxiv, 70.

On the basis of the degree of abnormality, the cases reported have been tabulated in three groups. Those showing marked abnormality have been omitted. In addition to the laboratory findings the patients' age, the diagnosis, the systolic and diastolic blood-pressures, and the presence of cardiac enlargement, œdema, albumin, and casts have been considered. The following norms have been adopted for the dietary tests and blood analyses: maximum specific gravity, 18 or higher; variation in specific gravity, 9 or more; volume of the night urine, 400 cubic centimeters or less; specific gravity of the night urine, 18 or more; urea-nitrogen concentration of the blood 0.020 gram per cent or less, and uric acid concentration of the blood, 0.0025 gram per cent or less.

The tables summarize the data of 100 cases of moderate and slight abnormality respectively. All showed renal involvement from the clinical point of view. In 66 per cent there was abnormality in the dietary test, while in 74 per cent uric acid in the blood was increased.

It follows from these facts that the uric-acid concentration of the blood is a delicate, if not the most delicate, index of renal function at our disposal. The individual abnormalities in the authors' series were as follows: 26 as regards maximal specific gravity, 49 as regards variability of specific gravity, 40 as regards volume or concentration of the night urine, and 35 as regards the urea-nitrogen content of the blood. An abnormal dietary test with normal blood findings was found in 8 per cent of the cases. In only 6 was there an abnormally high urea with a normal uric acid concentration. The figures obtained indicate that 400 cubic centimeters is the upper normal limit for the volume of the night urine, provided the patients are kept in bed during the test period. At any rate the authors have never found more when there was no reason to suspect renal involvement.

If each test is considered as a whole, the figures indicate that the results are similar with either the bland or the relatively high protein and salt diets. Owing to the small quantity of solids which it contains, the bland diet tends to lower the specific



gravity of the night urine. As would be expected, the volume of the night urine is greater in cases with fixation of specific gravity following the regular diet than following the use of the bland diet. On the whole, it appears that both tests may be used interchangeably. The advantages of the bland diet are that it is easily prepared and may be used when a high protein diet is undesirable or in cases of digestive disturbance.

MAX KAHN.

**Crabtree, E. G.: Blood-Transfusion in War Surgery in the British Army.** *Boston M. & S. J.*, 1919, clxxxi, 60.

Crabtree reports his experience in blood-transfusion with the British Army beginning in 1917 at which time it was necessary to establish transfusion teams for the treatment of patients arriving in poor condition in order to obtain a safe operating margin.

American surgeons instituted the procedure of giving several hundred to 1,000 cubic centimeters of blood instead of from 500 to 600 cubic centimeters and demonstrated that the paraffin-coated tube method was a more rapid and efficient means than either the citrate or syringe method.

Transfusion on so large a scale as that in the British Army during 1918 has yielded facts in regard to the value of blood and of the comparative value of fresh blood and fluids intended as substitutes for blood which will be of value in the treatment of accident cases in civil life.

In severe shattering injuries to bone where fixation is next to impossible, early operation followed by immediate careful treatment of shock was clearly more profitable than awaiting a long, slow recovery which was precarious throughout its course. An hour's heat and morphia and 700 cubic centimeters of blood almost invariably gave a safe operation margin. Five hundred cubic centimeters more of blood immediately following the operation restored the patient to nearly his pre-operative condition.

The intravenous use of saline was unsatisfactory and even harmful. Subcutaneous injections were also unsafe. Slight improvement which was noted immediately following intravenous saline was most often followed by collapse within a half hour. In severe cases of gas gangrene, particularly when there is vomiting, bicarbonate of soda in glucose solution has proved of inestimable value when given alone or with transfused blood.

The writer advises blood-transfusion for patients not in extreme shock but arriving in poor condition and showing little improvement after a half hour of rest, heat, fixation and morphia; for patients in extreme shock when early operation is necessary to save life; and for those with severe wounds but offering a safe operation margin who survive operation in a fair condition, but who often fail and die the second or third day with the onset of sepsis.

Patients who are anæmic from previous loss of blood, amputations, sepsis, or a combination of these, who have open wounds which will require granulation in order to heal show marked improve-

ment in their general condition and a clearing up of the local wounds on transfusion with from several to eight hundred cubic centimeters of fresh blood.

Experiences of this war have given further proof that transfusion is of no value whatsoever as a curative measure in septicæmia. H. A. McKNIGHT.

**Bernheim, B. M.: Hæmorrhage and Blood-Transfusion in the War.** *J. Am. M. Ass.*, 1919, lxxiii, 172.

The author relates his experiences in the treatment of cases of severe shock, hæmorrhage, and anæmia, by infusions of gum solution, saline solution, and blood. Of the three, the blood was considered by far the most valuable. In several severe cases of infection in which considerable blood had been lost very marked improvement resulted from blood-transfusion which in many instances was combined with injections of saline solution.

L. H. HILLS.

**Zingher, A.: Blood-Transfusion as a Therapeutic Aid in Subacute Sepsis Associated with War Injuries.** *Mil. Surgeon*, 1919, xlv, 75.

The purpose of Zingher's article is to draw attention to the necessity for the more frequent and extensive use of small and repeated blood-transfusions in our military base hospitals. It is necessary only to go through a series of wards containing surgical cases to realize how beneficial such transfusions would be for these pale, septic-looking, and emaciated patients. The great aid which is so badly needed in the form of a rich supply of red blood-cells and blood-protein is frequently withheld from these patients partly because of a lack of appreciation of the value of blood-transfusion in such cases and partly because of the lack of centralized special responsibility for carrying out such transfusions.

The indications for blood-transfusion are:

1. Extensive suppurating wounds associated with a subacute form of sepsis.
2. Compound infected fractures associated with a subacute form of sepsis.
3. Various grades of anæmia associated with a subacute form of sepsis.
4. Various grades of emaciation and partial marasmus.
5. Before and after severe operations as an emergency measure.

While in the forms of acute infections associated with septicæmia, blood-transfusion has not shown any extraordinary results, in the more subacute forms with prolonged and extensive suppuration the effects would be excellent.

For the anæmias the transfusion of blood is certainly indicated. It supplies a fresh amount of blood and also stimulates the patient's blood-forming organs to continue producing an increased number of red blood-cells.

For cases showing extensive grades of emaciation from various causes transfusions are definitely



indicated. Repeated small blood-transfusions, by acting as a new stimulant and an important nutritive element, will be certainly beneficial to the undernourished and devitalized tissues.

The cases requiring blood-transfusion as an emergency surgical measure are self-evident. Yet lives are often sacrificed by failure to give such transfusions either before or, more often, after an extensive shock-producing operation.

The testing of donors and patients for blood-grouping can be readily and conveniently accomplished by the method of Moss, using for the test a serum of Group II and a serum of Group III. These test-sera should be kept in sealed glass capillaries so as to have them in convenient form for immediate use. A drop of each of the two sera should be placed on a clean glass slide and a drop of blood from the finger of the donor or patient added to each. When no agglutination of the red blood-cells takes place the individual belongs to Group I. When agglutination occurs with serum of Group III, and not with serum of Group II, he belongs to Group II, while agglutination with serum of Group II and not with serum of Group III indicates that he belongs to Group III. Agglutination with both sera indicates that the individual being tested belongs to Group IV.

The great importance of the subject calls for the assignment of the work connected with blood-transfusions to a specially qualified officer. Such an officer, fully acquainted with the technical details and indications for transfusion, should be available in every base hospital and base hospital center, and should be called into consultation on suitable medical and surgical cases in which a transfusion is indicated. In a general way he would be able to know most of the very ill patients throughout the wards and help the surgeons in the selection of those requiring transfusion.

It is usually conceded that for nearly all purposes the citrate transfusion is the simplest and best. The amount of sodium citrate to be used varies with different operators. In the strength of 0.2 per cent of sodium citrate in the final mixture (1 part of 2 per cent solution of sodium citrate and 9 parts of blood) the blood will frequently clot at the time of withdrawal and give considerable difficulty at the time of injection. A circular from the Surgeon-General's Office recommends 0.7 per cent sodium citrate. More than four years ago the author advised the use of a 0.33 per cent citrate strength. He adds to each cubic centimeter of a 10 per cent solution of sodium citrate 30 cubic centimeters of blood. The greater concentration of the original citrate solution also obviates an unnecessary dilution of the blood to be injected.

The conclusions drawn are as follows:

1. Blood-transfusions should be used more extensively in the treatment of wounded soldiers in the base hospitals.

2. Officers should be especially assigned to this work in the different base hospitals and base hospi-

tal centers, and their sole duties should be in connection with the giving of transfusions, consultations on surgical and medical cases, and keeping track of suitable donors.

3. One of the special indications is subacute sepsis associated with extensive suppuration or infected compound fractures and with anæmia and emaciation of varying grades. This treatment should be given also as a prophylactic measure in the cases of enfeebled patients before severe operations and in postoperative surgical shock resulting from extensive loss of blood during an operation.

4. Large pockets of pus, suppurating joints, or extensive empyemata must, of course, be freely incised and drained. Blood-transfusion will not help in the elimination of these sources of continuous re-infection unless they are carefully watched for and taken care of as they arise. Autopsies often bring such complications to light.

5. The amounts of blood transfused should be moderate, from 250 to 300 cubic centimeters, and repeated, if necessary, every seven to fourteen days.

6. Systematic efforts should be made to discover patients needing transfusions in the base hospitals. Special studies should be made and careful records kept after the transfusions so that as soon as possible, tabulated data may be obtained which will help in indicating more definitely the value of blood-transfusion in cases of subacute sepsis associated with extensive wounds and fractures.

G. W. HOCHREIN.

#### Smith, J. F.: Mesenteric Embolism and Thrombosis. *Wisconsin M. J.*, 1919, xviii, 1.

The three cases of mesenteric thrombosis reported by the author emphasize the statement often found in literature that embolism and thrombosis of the mesenteric vessels is the most rare as well as the most serious acute abdominal condition.

Arterial obstruction is due to embolic plugging of the vessel, thrombotic obliteration, or a combination of the two. Embolism occurs most frequently in the upper mesenteric vessels. Arterial sclerosis forms the background of thrombosis.

Venous obstruction is more complicated. Two types are described: the descending type in which the process begins in the portal vein and extends to the small branches, and the ascending type in which it has its origin in the small mesenteric veins and extends upward, finally invading the larger venous trunks.

In a series of cases collected by Jackson, Porter, and Quinby, 50 per cent of all the patients were between the ages of 30 and 60. The foremost symptom was general abdominal pain, which was present in all but 3 cases. As a rule there were nausea and vomiting. In 41 per cent of the cases the stools were bloody. In 70 per cent there was abdominal tenderness. Distension was a frequent sign.

The diagnosis is difficult but especially in cases of cardiac and blood-vessel conditions favorable to



the development of embolism or thrombosis, mesenteric occlusion should be suggested by acute abdominal pain with tenderness, the vomiting of dark-colored or fecal material, and bloody stools.

The prognosis is extremely bad. The treatment is essentially surgical, although according to some authors the operative mortality is as high as 92 per cent.

The best operation is resection. Because of the doubtful viability of the adjacent portions of the intestines and the patient's poor general condition, however, resection is often too formidable and uncertain. Mickulicz recommends bringing the doubtful loop outside of the abdomen and stitching it into the wound.

The author agrees with Roswell Park, who said: "In the presence of sudden and acute symptoms, which include intense abdominal pain, collapse, and rigidity of the abdominal wall, very little time should be wasted in speculation as to the cause of the lesion."

R. B. BETTMAN.

### BLOOD AND LYMPH VESSELS

**Guthrie, C. C.:** The End-Results of Arterial Restitution with Devitalized Tissue. *J. Am. M. Ass.*, 1919, lxxiii, 186.

The author presents an interesting experiment in which the common carotid artery of a dog was divided and a segment of vena cava which had been preserved in formaldehyde solution for sixty days was inserted. The implanted tissue was treated with ammonia and absolute alcohol and impregnated with petrolatum.

Twenty-one days later when the operative area was re-opened the blood was found to be passing through the segment. The animal died a natural death approximately fourteen months later. At autopsy the artery showed an enlargement 3.5 centimeters long and 2 centimeters in diameter which was fibrous and vascularized, but springy and patent.

The experiment was performed with the intention of demonstrating that foreign devitalized tissue may be used in vascular restitution. Such tissue acts as a bridge-work over which new tissue may be formed. Similar work has been done recently by Nogeotte and Sencert.

L. H. HILLS.

### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Bradburn, W. P.:** The Treatment of Burns. *Internat. J. Surg.*, 1919, xxxii, 208.

The treatment of burns is not yet satisfactory. Although it is usually conceded that if two-thirds of the body area is burned, the patient will die, yet death occurs often in cases of less extensive burns. This is due to shock and a toxæmia resulting from altered protein metabolism which causes gastrointestinal disturbance. Renal involvement is common and delirium and convulsions may be present

although many who have been burned retain their full mental faculties to the end.

Burns may be classified as those of the lesser type which heal under nearly any treatment, and those which are more severe and very difficult to manage.

For the first type the initial dressing may consist of anything to exclude air, such as various oils—olive, cottonseed, caron, etc.—but preferably wet dressings of boracic acid, bicarbonate of soda, etc.

The bleb, which acts as a protection from the air, should always be preserved unless infection of the contained serum should occur, when it should be removed as a whole with the scissors. A good dressing for this type of case is a dram each of boracic acid, sodium chloride, and sodium bicarbonate to a pint of water and should be changed not oftener than every forty-eight hours. If the raw surface is exposed, two methods may be used. After cleaning with sodium bicarbonate solution and drying, two layers of paraffin with cotton between them and covered by a dressing may be applied, or the "open-air method" may be used. The latter is described as follows: Twice daily the burn is immersed in 5 per cent sodium bicarbonate for from one-half to one hour, after which it is dried and dusted with a powder containing not more than 10 grains of chlorotone with compound stearate of zinc. The chlorotone is analgesic and in large doses also soporific.

When granulations have formed, strapping with adhesive is highly recommended. This should be done in such a way as to draw the edges of the burned area together and should be repeated in forty-eight hours.

The more severe burns have two critical stages, that of shock and initial toxæmia occurring in the first forty-eight hours, and that of sloughing after an interval of forty-eight to seventy-two hours. To alleviate the pain and shock large doses of morphine may be given,  $\frac{1}{4}$  grain repeated in a half hour or, if the patient is in great agony,  $\frac{1}{2}$  grain at once. The patient should then be placed in bed and warmed, and proctoclysis instituted, 6 ounces of black coffee being used per quart of 5 per cent sodium bicarbonate and glucose solution every three to four hours. Hypodermoclysis or intravenous infusion may be substituted in case of diarrhoea. Warmth, a cradle to support the bed clothing, and chlorotone alleviate the suffering.

When the shock has been overcome, the burn may be treated by various applications but hydrotherapy is recommended. The patient is suspended on a sheet in the tub with the water at 100 to 105 degrees Fahrenheit and sodium bicarbonate is again added. At night he is placed upon an air or water mattress and dusted with compound stearate of zinc containing chlorotone if need be.

When the danger of septicæmia is passed any of the methods used for treating burns of the less severe type may be used, and skin grafting or plastic operations employed as indicated. M. H. HOBART.



**Long, H. F.: Burns and Their Treatment.** *Internat. J. Surg.*, 1919, xxxii, 217.

Burns are the destruction of tissue by any form of heat and most commonly are produced by hot water, oil, tar, or steam. Other agents are hot metals, explosives, electric contact, and clothing which has caught fire. The usual classification of burns according to their degree is not necessary for treatment as they are all handled alike.

The chief symptoms are pain, which is most severe in scalds and least severe in burns from an electric current, and shock which varies with the individual, being worst in children with extensive deep burns. Locally there may be only the faint blush of sunburn or actual charring. Nephritis, gastroduodenitis, and pneumonia are the common complications.

Burns are clean wounds of which the pathology and healing process should be thoroughly understood in order to treat the condition intelligently. When the cells have been destroyed by heat, their place is taken in the healing process by the regeneration of the remaining cells by mytosis. These cells grow in from the edge of the wound and also from isolated cells about sweat glands or those which have escaped unharmed. As they are only one layer deep when newly formed they are easily detached by a dressing such as gauze, or macerated and destroyed by the use of grease or oil.

According to the author the best method of treating burns is to strip the patient, put him to bed in a room the temperature of which is maintained at 90 degrees F., and dust the lesion with a powder such as stearate of zinc. No dressings or bed clothing should be used. Morphia should be prescribed for pain, and treatment given for shock if necessary. Dry scabs should be removed as soon as they begin to loosen up in order to prevent the formation of pus.

The article is summarized as follows: (1) a burn is not an infected wound; (2) no dressing should be used; (3) scar tissue is not a sequel of the treatment recommended; (4) treatment is best carried out in a hospital; and (5) cases usually requiring three to six months for cure will heal when treated in the manner described in from two to three weeks.

M. H. HOBART.

**McDonald, A. L.: The Treatment of Burns.** *Ann. Surg.*, 1919, lxix, 312.

The author had an opportunity to treat 31 cases of extensive burns following the forest fires of October 12, 1918. From this experience he concludes that dressing the burn with gauze soaked in 10 per cent sodium bicarbonate solution and moistened every hour or two is the most simple first-aid treatment and gives the greatest comfort. Morphine should be prescribed to give rest but must be administered with care as often severe reaction and depression follow its use. The treatment of shock with posture, heat, hot drinks and stimulants may be necessary.

Paraffin is preferable to gauze with oily dressings and should be substituted as soon as possible. The author used it within thirty-six hours. This method should be quite painless. Dichloramine-T in oil causes pain and is of doubtful value. If there is extensive sloughing, wet dressings should be applied.

The use of adhesive strapping over the raw surface is highly satisfactory and simplifies the later treatment since the dressings may be extended to two or three days. If adhesive is applied skin grafting will rarely be necessary. GATEWOOD.

**Black, H. R.: The Management of Burns.** *Internat. J. Surg.*, 1919, xxxii, 218.

More deformities result in civil life from the mismanagement of Colles' fracture, Pott's fracture, burns of the second, third, and fourth degree, and fractures about the elbow-joint than from all other injuries combined. In railroad surgery compound comminuted fractures, extensive burns, and crushing injuries give the greatest number of resulting deformities.

Burns should be treated with the idea of preventing and minimizing contractures and resulting deformities. Those of the first degree need not be considered. Many severe burns when seen early may be treated with an application of soda paste, a 1 per cent solution of picric acid, or an oil dressing, together with an anodyne for comfort. Many other agents may also be used, but care should be taken to avoid systemic medicinal poisoning, especially by boric acid, alcohol, picric acid, and iodoform applied to extensive raw surfaces and used in the treatment of children. Open-air treatment is not recommended because of the danger of infection. The formation of crusts tends to delay healing.

During the period of sloughing the wound should be kept clean in order that the amount of pus will be decreased, the parts softened, the absorption minimized, the temperature lessened, the repair hastened, and the patient made more comfortable. This can be done by the application of a 25 per cent solution of peroxide of hydrogen followed by saline irrigation.

The stage of repair is shortened by the use of autogenous skin grafts which should be applied immediately after the sloughing has occurred as delay allows the formation of granulation tissue which lessens the viability of the graft. Thiersch's method of grafting is recommended. The skin should be cleansed with tincture of green soap and water and alcohol, and a dry dressing should be applied the afternoon or evening preceding the operation. Rough edges and granulating tissue should be removed, bleeding controlled with hot compresses, and the grafts which should be obtained by using a flat razor, covered with guttapercha tissue and a dry dressing. Never remove a graft even if it appears not to be taking, as a part of it may live.

If for any reason a graft cannot be used the wound



may be completely covered with inch-wide adhesive strips. The mechanical effect flattens granulations, acts as a low-grade irritant, and retains the heat and moisture. No solutions should be used. Large burns may be treated in this way.

Care should be taken, especially in burns of the hands, fingers, flexor surfaces of the elbows, knees, and axillae, to keep the part in extended position to prevent contracture deformities.

Severe burns of the neck are dressed in the over-corrected position with the face turned away from the affected shoulder and chin as far from the sternum as possible, and held there by a plaster collar from two to four months after the wound has healed.

M. H. HOBART.

**Bohmanson, G.: On the Diagnosis and Therapy of Bone Typhoid.** *Ann. Surg.*, 1919, lxi, 245.

The author reports a case of multiple typhoid osteomyelitic foci occurring in a girl 18 years old who gave no history of typhoid. With the exception of measles, she had never had any illness up to the time trouble developed in the right hip-joint. Some months later a lesion appeared in the left clavicle which finally discharged and remained open for about a year. Six months after this had healed a large fluctuating mass developed in the right gluteal region. On the assumption that this lesion was tuberculous it was opened with a trocar, drained, and injected with iodoform-glycerin emulsion. At this time the blood-serum would not agglutinate either typhoid or paratyphoid bacilli. The Wassermann reaction was negative.

Finally an incision was made over the clavicle and a peculiarly disintegrated bone focus was dissected out. Bacteriological examination of the material thus obtained revealed a typhoid-like bacillus in pure culture. Its strongest agglutination was with serum from typhoid patients. Accordingly, a vaccine was prepared and given in increasing doses. As the virulence of the organism was very low, however, other vaccines were made after the strain was passed through five guinea pigs to increase its virulence. Under this treatment the patient improved very rapidly.

While the author has had only one case of this kind, the results he obtained from autogenous therapy were very encouraging, and further experimentation along this line seems justifiable. He believes that multiple foci occur in bones as the result of typhoid infection more often than is shown by statistics.

The condition described may develop when there is no history of typhoid and even a positive Widal reaction is not essential. In cases of isolated foci the patient should be subjected to a systematic X-ray examination as secondary foci are frequently overlooked. The diagnosis can be made with certainty only by bacteriological examination. Radiographs show nothing specific. The foci are usually readily accessible and should have the benefit of operative treatment.

GATEWOOD.

## EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Scammon, R. E.: Some Graphs and Tables Illustrating the Growth of the Human Stomach.** *Am. J. Dis. Child.*, 1919, xvii, 395.

This article is based on more than 1,400 determinations of the net weight of the stomach the earliest of which were made in the latter part of the third month of foetal life when it weighs 0.125 gram. The weight is tripled in the fourth month and more than quadrupled in the fifth month. In the sixth month of foetal life it is 1 gram and at term approximately 6.5 grams. During the early part of prenatal life the stomach approximately doubles its weight each month and during the last third increases it by 40 per cent. At term its weight makes up 0.2 of 1 per cent of the body-weight.

In postnatal life most of the large organs increase in weight approximately 12 times until early maturity. In the same period the weight of the stomach increases about 24 times. Its most rapid growth is in the first trimester after birth. The stomach of the adult weighs 154.5 grams.

The data on the growth of the internal surface area of the stomach are limited.

The results of investigations of the cubic contents of the stomach at various ages and its anatomic capacity are also reported in detail. I. E. BISHKOW.

**Kawamura, K.: Studies on Organ Transplantation. I. Transplantation of the Thyroid Gland with Intact Blood-Supply.** *J. Exper. Med.*, 1919, xxx, 45.

The author mentions two methods of free grafting of a gland: the transplantation of pieces of tissue and the transplantation of the whole organ with anastomosis of its blood-vessels to those of the same person or another person. In 1892 von Eiselsberg transplanted the thyroid gland in a cat. Half of the gland was removed and transplanted into the abdominal wall. Several weeks later the other half of the gland was extirpated. The animal remained in good condition but died when the transplanted thyroid was removed. Since that time many instances of thyroid grafting, both experimental and clinical, have been reported, and it has been shown that thyroid grafts in animals take and functionate.

Kawamura performed all of his experiments on dogs. Since the relation of the thyroid to its vessels in the dog is different from that in man, he describes this difference before describing his technique of transplantation. In a dog the glands are spindle-shaped, situated beside and beneath the larynx, usually separated from each other, and more or less covered with muscle. The dog, especially the bulldog, has a relatively large thyroid which is not always proportional to the animal's size; a small dog may have remarkably large glands due to the development of a so-called colloid goiter.

The arterial blood reaches the gland mainly through the superior thyroid artery which arises



from the common carotid and enters the gland at its upper pole after an upward convex curve. As the inferior thyroid artery is very small, it may usually be ignored in the transplantation of the thyroid. The venous blood flows out through two veins, the superior and inferior thyroid veins. The superior thyroid vein leaves the upper pole of the gland and empties into the internal jugular vein, while the inferior thyroid vein, consisting of two stems, opens into the same vein further down. The diameter of the superior thyroid artery and thyroid veins is scarcely greater than 1.5 to 2.5 millimeters. It is, therefore, almost impossible to anastomose these vessels.

In the experiments reported the thyroid gland was dissected from the surrounding tissue, the superior thyroid artery and superior and inferior thyroid veins being left intact. In most instances the gland was extirpated with a portion of the internal jugular vein and a segment of the common carotid artery, connecting the thyroid veins and the superior thyroid artery respectively. The gland was immediately wrapped in a sponge saturated with warm salt solution. After a few minutes it was transplanted to the other side of the neck of the same dog or into the neck of another dog whose thyroid had been previously removed. The segment of common carotid was inserted in the place of the other below the point of outlet of the thyroid artery. The peripheral end of the internal jugular vein was united to the central end of the internal or external jugular vein of the recipient by end-to-end anastomosis.

In two animals the peripheral end of the internal jugular vein was united to the wall of the external jugular vein (end to side). Moreover, in two cases, after resection of half of the spleen, the thyroid was transplanted to the splenic vessels of the same animal. In these instances the superior thyroid artery was sutured to the splenic artery and the internal jugular vein to the splenic vein by end-to-end anastomosis. The time required for the extirpation of the gland and its complete transplantation was usually from one to two hours. The clamp on the veins was removed first and then that on the artery. As soon as the clamps were unfastened the gland became normal in color but it was somewhat distended. Several days after the operation the wounds were opened and the condition of the transplanted thyroid gland examined. As a rule if the gland appeared normal the other intact thyroid was fixed in 10 per cent formaldehyde for microscopic examination.

After making these experiments the author draws the following conclusions:

The experiments on dogs showed that the thyroid gland which was autoplastically transplanted by means of various methods of blood-vessel anastomosis could live in good condition and functionate favorably several months after the operation, even after the interruption of the circulation for one and one-half hours. They further showed that the circulation through the transplanted blood-vessels as well as

glands was as good as normal and that permanent successful results of the homoplastic transplantation of the gland are as yet not possible. G. E. BEILBY.

**Kawamura, K.: Studies on Organ Transplantation. II. Transplantation of the Spleen with Intact Blood-Supply. *J. Exper. Med.*, 1919, xxx, 65.**

During the last fifteen years organ transplantation has been studied extensively with especial reference to practical therapeutics and the biological possibility of regeneration of transplanted tissues.

Failure in the transplantation of pieces of the organ, however, is partly attributable to insufficient blood-supply in consequence of which the grafts are gradually absorbed. Moreover, it should be taken into consideration that small pieces, although successfully transplanted, are not always sufficient for the function. Transplantation of the entire organ by anastomosis of its blood-vessels to suitable parts of the circulatory system can yield sufficient nutrition and probably function also.

A series of experiments was performed on dogs. The artery and vein from the spleen to the gastrosplenic vessels have usually two trunks. One pair enters the spleen in its lesser (left) end and another almost in the middle. Mattress sutures having been applied transversely to the spleen in the experiments reported, it was divided into two parts corresponding to the stream district of these large branches. The half of the spleen which is nourished by the larger branches was used for the transplantation. The splenic artery, vein, and nerves were dissected and divided and Crile clamps applied. The caliber of the artery was hardly 1.5 millimeters in diameter. The spleen was then removed and wrapped in a salt sponge. After a few minutes it was replaced into the abdominal cavity and its vessels were united as before, by end-to-end anastomosis.

In another case an attempt was made to transplant the spleen into the neck. After the thyroid was removed the peripheral end of the splenic artery was united to the central end of the superior thyroid artery and the peripheral end of the splenic vein to the central end of the external jugular vein. In another case the spleen was transplanted into the renal vessels after nephrectomy.

Most of the experiments were performed autoplastically, but in one instance the spleen from one animal was transplanted to another. The arterial suture was always difficult, due to the small caliber of the vessel. As soon as the clamps were unfastened, the bluish-red collapsed spleen became very red and its volume was increased. The circulation in the spleen was re-established between one and two hours after its extirpation. The dissected omentum was reunited and in a few cases the nerves also were sutured. Several days after the operation the condition of the transplanted spleen was ascertained by laparotomy. When the transplantation was successful, the other intact half



of the spleen was removed and immersed in a jar filled with 10 per cent formaldehyde solution for microscopic examination and the animal was observed further.

The results of the experiments immediately after operation were in all cases satisfactory. In spite of the interruption of the circulation from one to two hours after extirpation, the immediate circulation of blood through the transplanted spleen and blood-vessels was favorable but most of the spleen became necrotic or was entirely absorbed. The cause of this was the obstruction in the transplanted vessels, due to thrombosis. It is probably difficult to obtain good results by using so small a vessel as a branch of the splenic artery. Carrel has noted that a small vessel cannot be sutured with much chance of success. All of Luedke's experiments failed.

Regardless of these difficulties, the successful case showed that such a highly differentiated, complicated organ as the spleen can be transplanted *en masse*; that it can keep permanently its normal structure, and probably also can functionate normally. In this instance the difference between the central and peripheral parts of the grafts, as Manley and Marine discovered by piecemeal transplantation, was not visible. This is scarcely to be expected because in transplanting by blood-vessel sutures the nourishment of the transplant is maintained throughout.

In view of the fact that the spleen can survive even if the nerves are not united, the experiment demonstrated that nerves are not essential for the maintenance of grafts.

The neck, probably also the inguinal furrow, is not a favorable site for the experimental transplantation of the spleen by blood-vessel suture because after the suture of the fascia and skin the more or less distended spleen is compressed and consequently disturbances of the circulation through the graft may occur.

Seven autoplasmic transplantations and one homoplasmic transplantation of the spleen of dogs were made. One autotransplantation was successful, the gland being normal at the end of eighty-eight days.

G. E. BEILBY.

**Woglom, W. H.: The Size of the Spleen in Immune Mice.** *J. Cancer Research*, 1919, iv, 281.

It has been asserted in recent years by not a few authors that the spleen is enlarged in mice which have or are immune to propagable tumors. Moreover, it has been implied, if not actually stated, that the hypertrophy is an expression of the important part taken by this organ in the elaboration of protective substances of all kinds. This involves the subsidiary assumption that immunity to transplantable new growths is due to some sort of antibody, though it is admitted that no evidence of the presence of any antibody similar to those active against the various bacteria has yet been offered.

The paper is concluded with the following brief summary:

While it is not denied that the spleen is concerned in bringing about immunity to propagable neoplasms, there is no evidence to show that the refractory state in mice is regularly accompanied by any enlargement of this organ appreciable to measurement. Some immune mice have enlarged spleens and some have not; some animals with progressively growing tumors have enlarged spleens and some have not. And the existence of other causes of splenic hypertrophy, such as mouse typhoid, transfers the burden of proof to those who assert that splenic hypertrophy is referable to immunity.

G. E. BEILBY.

**Fischer, A.: Multiple Tumors of the Mouse Mammary Gland: Are They Independent or Metastatic?** *J. Cancer Research*, 1919, iv, 325.

Malignant neoplasms in man begin, as a rule, as single tumors, and the multiple growths which appear later are, as is well known, due to secondary spreading from this primary focus. However, multiple primary tumors are now and then to be met with and in the articles of Harbitz, Tanberg, de Besche, and Wolff, large series of such cases have been collected and discussed.

Harbitz arranges such multiple tumors in four groups: (1) tumors of the same nature and in the same organic system; (2) tumors of the same nature but in different organs; (3) tumors of different nature and in different organs; and (4) the carcinosarcomata.

Most of these tumors showing primary multiplicity are benign. In man the genuine malignant tumors are less often primarily multiple.

When all is considered, therefore, it appears probable that the multiple tumors of mice are independent and not metastatic growths, though no direct proof has been produced. As the point is of considerable interest, and our knowledge of the anatomical conditions upon which the question is based is defective, an attempt was made to examine these conditions somewhat more closely. The method employed was the injection of insoluble particles into the mammary and a study of their transportation and deposition, it being assumed that in all likelihood tumor cells would follow the same path.

The technique was as follows: India ink was injected into the mammary through the nipple by means of a small syringe with a very fine needle. The quantity injected was about 0.1 cubic centimeter. Female mice which had developed spontaneous tumors in one or more mammary were used for the experiments. In some of the animals the injection was made into one of the still normal mammary, in others into the tumor itself. By preference the ink was introduced into the inguinal mammary into which the injections could be made more easily.

The results were as follows:

1. When India ink was injected into the normal mammary gland, it always appeared in the regional lymph-nodes. At first the periphery, and later the



entire node, was of a more or less intense black color.

2. In the next stage the course of the India ink could be followed to the central nodes and on to other lymph-nodes on the same side. In some cases it was observed also in nodes on the opposite side.

3. No ink was found in another mammary gland.

4. When India ink was injected into mammary tumors, the results were the same except that transportation took place much more rapidly, both to the regional nodes and to those lying above and below them. In these cases, also, the ink was never transported to other mammary.

The conclusion may be drawn that small solid particles, like those of India ink, travel from the mammary through the lymph-channels to the regional nodes, and then on to more distant lymph-nodes, as they do in man. Direct transport from one mammary gland to another, such as might permit the assumption that the multiple tumors are of metastatic origin, was not observed. G. E. BEILBY.

**Kligler, I. J.: Growth Accessory Substances for Pathogenic Bacteria in Animal Tissues. *J. Exper. Med.*, 1919, xxx, 31.**

The subject of vitamins has of late occupied the attention of the biologist and biological chemist. The nature of these substances is still a matter of speculation, but the majority of workers accept the distinction proposed by McCollum and Davis. These authors recognize two classes of substances, the fat-soluble A and the water-soluble B. A more precise definition has not been possible because of failure thus far to isolate and identify the respective compounds. Their presence can be detected only by the effect they produce on the growing organism, usually the white rat. By noting the effect of the addition of various substances to a balanced vitamin-free diet, a rough indication can be obtained of the concentration of food accessory substances in the added material.

The object of this paper is to report experiments bearing on (1) the effect of vitamins on the growth of a number of organisms pathogenic for man; (2) the distribution of these substances in animal tissues; and (3) the relative significance of the fat-soluble A and water-soluble B in the cultivation of these micro-organisms. At present there are few data bearing on these questions in relation to bacteria.

In the course of the investigation beef heart, goat blood, rabbit and cat tissues, and human secretions were used. Unless otherwise stated, the method of extraction was always the same. The tissue or organ was obtained as free from blood as possible. The animals were first exsanguinated and the tissues washed free from visible traces of blood with saline solution. The material was then weighed, macerated into small bits, suspended in nine times its weight of saline solution, shaken thoroughly, and placed in the ice box over night. The following day the extract was centrifugalized, and filtered through a Berke-

feld candle. After testing for sterility the extracts were ready for use.

The growth of all the pathogenic bacteria studied by the author was favorably influenced by the addition of small amounts of tissue extracts.

Beef heart, rabbit and cat tissues, and human nasal secretions contain substances favorable to the growth of the organisms tested. The mucosa of different organs, spleen, liver, and kidney, are relatively rich in these substances, while muscle is relatively poor. The favorable effect of the extracts is manifested by an enhancement of growth and a reduction of lag.

The water-soluble substances are apparently those which are essential for bacterial development; the ether extract has no effect on growth.

Experiments are reported which indicate that the substances in question belong to the class of so-called "vitamines."

G. E. BEILBY.

**Merrill, E. D., and Wade, H. W.: The Validity of the Name "Discomyces" for the Genus of Fungi Variouslly Called "Actinomyces," "Streptothrix," and "Nocardia." *Philippine J. Sc.*, 1919, xiv, 55.**

The nomenclature of the group of fungi the pathogenic members of which produce the various actinomycoses, so-called, has been the subject of confusion which resulted from an unusual combination of circumstances. For some time it was a mooted question whether the organisms were of bacterial or fungous nature, partly because of erroneous conceptions of their morphology which is complex and variable and differs widely in different strains. Even yet opinions differ as to whether or not the forms involved should be included in a single genus. One of the types, a saprophyte, streptothrix foersteri Cohn, was for a time erroneously included in a genus of the higher bacteria, while the first pathogenic species described, actinomyces bovis Harz, having been recognized as a fungus, was given a different generic name. The question was further complicated by the fact that both names had long before been employed for entirely different organisms. Since then some authors have held one invalid, some the other, and some have rejected both.

As is too frequently the case, the systematist and the pathologist have tended to ignore one another's work and viewpoint. Medical writers who almost exclusively have been concerned with the study of these organisms, and consequently the use of their names, have been very prone to choose these because of convenience and local custom rather than to recognize and adhere to the rules of nomenclature by which modern biologists are bound. On the other hand, botanists have overlooked or ignored—and they still do—names that have been used by medical writers. It was to consider the matter from both viewpoints in an effort to determine the actually correct designation that the vicissitudes of nomenclature undergone by this group have been reviewed.



The authors summarize their discussion briefly as follows:

The source and present status of the various names that have been applied to the organisms of this group may be given as "cladotrix Cohn" (1875). This name was used as generically more valid than "streptothrix Cohn" (1875) by Winter (1884) and other systematists, the distinction not being understood. The organism of actinomycosis was assigned to this genus informally by Bostroen, Baumgarten, and others, and formally by Migula (1895). Cladotrix Cohn is a different type of organism and the name is, therefore, not applicable.

Streptothrix Cohn (1875) non Corda (1839): This name was applied by Cohn to a true-branching organism but placed in his classification as doubtfully synonymous with cladotrix. The resemblance to it of the fungus of actinomycosis in man was noted by Israel (1878). The name was adopted in 1890 by Almquist and by Gasperini for non-pathogenic air organisms, and in 1891 it was adopted by Rossi-Doria for that of actinomycosis.

For a time this was probably the most widely used name for the group. At present it is frequently applied to the group minus the organism of actinomycosis. It is unquestionably invalid in either connection because previously applied by Corda (1839) to an organism distinct from those under consideration.

Actinomyces Harz (1877) non Actinomyces Meyen (1827): This name was applied by Harz to the fungus of lumpy jaw of cattle by Gasperini (1894) to the entire group, replacing "streptothrix" and accepted in this application by Berestnew (1897), Lachner-Sandoval (1898), and others. It is now used by many writers, particularly the German and the American, as a valid name for the organism of actinomycosis only. It is seldom used in the more general sense. However, it is invalid because used in connection with an entirely different organism by Meyen (1827).

Bacterium Ehrenberg (1830): Affanassiew (1888) is said for a time to have called the organism of actinomycosis "bacterium actinocladothrix." This designation is manifestly inapplicable.

Actinocladothrix Affanassiew and Schultz (1889): This was proposed as a generic name by Affanassiew and Schultz in 1889 for the organism of actinomycosis. It did not receive the consideration to which it was certainly entitled, being of even date with the widely adopted "nocardia."

Micromyces Grueber (1891): This name was applied by Gruber to an actinomycosis-like organism that he called "M. hofmanni." This organism cannot be distinguished from the general group under consideration.

Oospora Wallroth (1833): This was adopted by Sauvageau and Radais (1892), who concluded that the group belonged to Wallroth's genus. Lehmann and Neumann (1896) adopted the same view, but later abandoned it, Lachner and Sandoval (1898)

having shown that oospora wallroth is an organism entirely different from those under discussion.

Sphaerotilus Kuetz (1883): This name was adopted by Engler for the group including cladotrix (streptothrix) foersteri Cohn, with which he included actinomycosis bovis Harz. This disposition was due doubtless to the misapprehension as to the distinction between cladotrix and streptothrix.

Actinobacillus Lignières and Spitz (1902): This name was applied by Lignières and Spitz to a supposed subtype of this group. The distinction has not been recognized and by most authors the name is considered a synonym.

Carteria Musgrave and Clegg (1908): The adoption of this new name (as "carterii") was tentatively suggested by Musgrave and Clegg as possibly advantageous for the purpose of avoiding further controversy, although they did not definitely advocate such a highly informal procedure.

Nocardia Trevisan (1889): This name was adopted by DeToni and Trevisan to cover the entire group. Blanchard used it for a time in its original application, and Wright (1894) adopted it for non-pathogenic strains only. As many other authors use it in one sense or another it has of late gained much prestige. Vuillemin, and Chambers and Christopherson have recently adopted it for the entire genus. Its validity has been denied on the grounds indicated in the discussion that follows:

Discomyces Rivolta (1878): This name was definitely substituted by Rivolta for actinomyces, with the change of name of Bollinger's fungus to "discomyces bovis." It was practically ignored until Blanchard (1900) argued its priority over "nocardia." Subsequently Geddoelst, Brumpt, Manson, Stitt, and for a time Castellani and Chalmers, adopted it. As indicated in this discussion the name is clearly valid over actinomyces and all subsequent names.

G. E. BEILBY.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Buchbinder, J. R.: A Simple and Accurate Technique for Foreign-Body Localization.** *Illinois M. J.*, 1919, xxxvi, 19.

The author advises the use of stereoradioscopy for locating embedded foreign bodies. In order to intensify the stereoscopic affect and aid in the localization, metal markers of different shapes are placed over various landmarks—the wound of entrance, for example. When feasible, a probe may be inserted into the wound. In pelvic localizations, a finger inserted into the rectum serves as an additional guide.

The author has had very good results with this stereoradioscopic method. Many of the compasses, profundometers, and radioscopimeters which have been advocated, especially during the war, are very ingenious, and by their use the depth of the foreign bodies may be calculated accurately. The chief objections to them are that they do not give the operator a clear mental picture of the



anatomical relations about the foreign bodies, they cannot be adapted to all types of cases, and they are cumbersome.

R. B. BETTMAN.

**Péhu and Daguet: Clinical and Radioscopic Studies on the Immediate and Remote Sequelæ of Serofibrinous Pleuritis** (*Études cliniques et radioscopiques sur les séquelles immédiates et lointaines des pleurésies sérofibrineuses*). *Rev. de méd.*, Par., 1919, xxxvi, 101.

The authors have had the opportunity to study a large number of soldiers suffering from pleurisy and in various stages of the disease. Clinical, radioscopic, and autopsy findings are reported. Systematic examinations were made of 272 patients who at some period, varying from one month to twenty years previously, had had serofibrinous pleurisy.

Either immediately or a few weeks or even some years after the onset of the pleurisy, complications always involved the apex of the lung, the diaphragm, or the lung cavity, and on radioscopic examination it was quite easy to observe opaque patches which usually were localized in the apex. The diaphragmatic function was frequently disturbed. The pleura remained thickened for a long time after the absorption of the serofibrinous effusion.

Both during the development and after the absorption of pleural effusions radioscopy is indispensable to complete the clinical exploration of the thorax. A series of such radioscopic examinations will furnish important data on both the anatomical and the functional conditions.

The authors' investigations have shown very clearly that more or less extensive chronic lesions of the serosa constantly follow in the wake of serofibrinous pleurisy. They demonstrate further that if the radioscopic examination shows neither obscurity nor mechanical disturbances of the diaphragm in the case of a patient who states that he has had pleurisy, it is very probable that the condition was not accompanied by an effusion.

There is a marked difference, however, in the picture after spontaneous pleurisy and that obtained after a traumatic effusion. While spontaneous effusions almost always leave traces, traumatic effusions (hæmo- or pyothorax) frequently do not.

The authors describe the obscure patches which, more or less triangular in shape and occupying about two-thirds of the hæmothorax, may be observed shortly after the cessation of serofibrinous pleurisy; also the distortions in the outline and the irregular movements of the diaphragm.

Complete examinations were made of 123 patients who had had a pleural effusion. About half of these were examined between six weeks and three months after the termination of the acute phase, one-fourth between three and six months afterward, and the other fourth after from six months to twenty-five years. The radioscopic aspects in these cases are classified into four groups according to the results. In the first group 22 effusions had been punctured and 26 had not; in the second 19 had been punctured

and 13 had not; in the third group 8 had been punctured and 8 had not; and in the fourth group 19 had been punctured and 8 had not. Altogether, therefore, 68 effusions had been punctured and 55 not evacuated.

The percentages are shown collectively thus:

Group 1. Good results: 32.3 per cent punctured; 47.2 per cent not punctured.

Group 2. Fair results: 27.9 per cent punctured; 23.6 per cent not punctured.

Group 3. Poor results: 11.7 per cent punctured; 14.5 per cent not punctured.

Group 4. Very bad results: 27.9 per cent punctured; 14.5 per cent not punctured.

The authors are therefore inclined to believe that the results obtained by puncture in serofibrinous pleuritis are not favorable. W. A. BRENNAN.

### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

**Extent of Medical Testimony.** *Hearn vs. Waterloo*, Iowa Supreme Court, 169 N. W., p. 392.

The Supreme Court of Iowa reviewed a personal-injury case in which a question as to the extent of medical testimony was decided. The attending physicians had testified as to their diagnosis from an examination of the plaintiff without the assistance of a roentgenogram. On cross-examination a roentgenogram was introduced which had been taken some time subsequent to the accident by someone else. The physicians testified that in their opinion their diagnosis was confirmed by this roentgenogram.

The rule of Court is that the defendant is entitled to have the opinions of the witnesses confined to their own examination but the Reviewing Court held that if there was any error in admitting references to this X-ray picture it was non-prejudicial and not reversible. The amount of the verdict being quite moderate, however, it was held that its moderation was strong evidence that the jury was undoubtedly uninfluenced by the evidence of which complaint was made. The testimony showed that the plaintiff suffered much, spent considerable time in a hospital, and had not fully recovered from the accident at the time of trial, approximately a year after the accident. J. A. CASTAGNINO.

**Expert Testimony—Cause of Injury.** *Med. Rec.*, 1919, xcvi, 23.

One of the most technical questions of a trial is the admission or exclusion of expert testimony. The general rule regarding admissibility of expert evidence is that when the questions issued before the jury are not within the ordinary common knowledge of the layman, expert testimony may be introduced to bring out such facts. However, many restrictions and limitations are placed upon the examining attorney. Probably the most important of these is that by his answers the witness must not invade the province of the jury. No witness, expert



or otherwise, may testify as to his conclusions regarding the ultimate fact which is to be proven.

Such a situation arose in the suit of Hoener vs. Koch for malpractice, in which the contention of the plaintiff was that the defendant was unskillful, the operation was unnecessary, and the diagnosis unscientific. On appeal, this question was brought up before the Illinois Supreme Court. The language of the Court in disposing of it was that while no comment would be made on the evidence in this case two errors had been noticed either of which was sufficient to reverse the judgment. Dr. Curtis, a witness offered by the defendant as an expert, having stated that he had heard the testimony, added: "I think that I can safely say that \* \* \* in view of all the testimony I have heard I can see no positive evidence of malpractice." To the Court it seemed apparent that the witness was allowed to decide the very question the jury was empaneled to decide. The witness might have been asked if the treatment the plaintiff received was proper treatment, but as it was, all the jury had to do and all they did do was to enter as their verdict Dr. Curtis' opinion. It was the opinion of the Court therefore that there was an error in allowing this testimony to go to the jury. The judgment in favor of the defendant was reversed.

A much more recent case in which the reviewing tribunal passed upon a somewhat similar question was that of Budde vs. National Travellers Benefit Association reported in the 169 W. 766. This was an action on an insurance policy. The Reviewing Court held that physicians may testify that in their opinion a kink or a loop in the bowels resulted from external violence but it would be improper for experts to testify as to what actually caused the condition. The latter is the exact point which the jury was called upon to decide and not the subject of expert evidence.

J. A. CASTAGNINO.

#### Physician Contracting for Salary and Employer Fees. *Sherrill vs. Union Lumber Co. (Texas)* 207 S.W.R. p. 149.

In the case of Sherrill versus the Union Lumber Co. the Reviewing Court assumes a judgment in favor of the defendant which was sued by the plaintiff for monies claimed to be due him for services rendered to injured employes of the Company under the Workmen's Compensation Act of the State. Testimony shows that the plaintiff, Dr. Sherrill, entered into a contract with the defendant company stating that he was to receive a salary for the services so rendered. It was stated in the contract that he was to receive a certain cash compensation for his services in treating the employes and that he was to have no claim against the insurer for such services under the Workmen's Compensation Act. The contract further stated that the Company might collect and retain such fees, a clause which the plaintiff contended was against the public policy. This the Reviewing Court de-

clined to hold, stating also that even if the Court were wrong in its contention, the plaintiff was undeniably a party to such agreement against public policy and was therefore *pari delicto* with the defendant in entering into the contract. Accordingly it would be unfair to allow the plaintiff to retain the rights of a part of the contract and repudiate that portion of it to which he objected.

J. A. CASTAGNINO.

#### Why a New Trial Was Denied in Malpractice Case. *Campbell vs. Peters, 102 Atl. Rep., p. 881.*

The Supreme Court of Maine had for consideration a malpractice case. The two questions raised on appeal by the defendant against whom a judgment was secured in the Trial Court were excessiveness of damages awarded and absence of liability. The decision of the Reviewing Court stated among other things that, according to the well-established rules of law and inasmuch as the testimony was the usual conflict between medical men, and as the jury had returned a verdict in favor of the plaintiff, this verdict should not be disturbed. In regard to the question of the excessiveness of the verdict, the court stated in substance that when the constitution and laws of the state gave the parties a right of trial by jury, the Reviewing Court is not authorized to substitute its judgment for that of the jury on this question except when it is patent that the verdict of the jury is clearly shown to be the result of bias, prejudice, and undue influence. J. A. CASTAGNINO.

### MILITARY SURGERY

#### Depage, A.: General Considerations as to the Treatment of War Wounds. *Ann. Surg.*, 1919, lxix, 575.

Since January, 1915, at l'Ambulance de l'Océan, débridement and épiluchage with primary suture have been applied whenever the cases appeared favorable, and secondary suture has been done as soon as the surfaces of the wound seemed clinically to be aseptic. As there was no formal index as to the evolution of the microbian flora in a wound, it was not possible to build up a systematic method of procedure. Then came the important contribution of Carrel and Dakin. The author does not describe the preparation of Dakin's solution but emphasizes the fact that the solution must be freshly prepared from day to day and that its reaction must be carefully tested. All preparations must be rejected which are not absolutely neutral.

Beginning with the admission of the patient to the hospital, the preparation is as follows:

1. The injured region is shaved and washed carefully with a neutral solution of oleate of soda.
2. Débridement and épiluchage of the wound are practiced immediately thereafter, and Carrel tubes introduced to the bottom of the wound in such fashion as to permit the irrigation of the entire wound surface.



3. To the entire surroundings of the wound compresses smeared with vaseline are applied to prevent irritation of the skin. The dressing consists of compresses of absorbent material.

4. After the return of the patient to bed, the Carrel tubes are connected up with a receptacle containing Dakin's solution and irrigation is carried out every two hours. In redressing the wound it is necessary that the slightest concretions should be removed as these always hide colonies of microbes.

By this method infected wounds are rendered sterile in from six to eight days. Osseous wounds are more difficult to sterilize, requiring treatment lasting from fifteen days to a month. It is necessary to remove all sequestra before sterilization can be obtained. Sometimes the wound is maintained sterile from the onset.

The conclusions as to suture up to the present are as follows:

Immediate suture is indicated in cases in which the clinical aspect of the wound after débridement and épluchage gives a guarantee of sufficient sterilization. This applies especially to wounds of joints and other serous cavities and to wounds of the cranium, face, hand, and foot in which the abundance of both blood and lymph supply warrants primary closure.

Delayed primary or early secondary suture is indicated particularly for wounds of the soft tissues and some open fractures. It is done after bacteriological tests. Grave accidents occur rarely in late primary suture. It may be done at any time from two to four days and does not necessitate refreshing the wound.

Late or secondary suture is reserved for wounds which cannot be sutured during the first days on

account of too extensive destruction of tissue or because of the development of infection.

The author then discusses wounds of the various organs. From his experience it seems that primary suture should not be done when the lesion is more than eight hours old, when it involves the muscular masses deeply, and when the tissues are much soiled and lacerated. If the wound is sterile at the beginning, this will be demonstrated by the microbic test and late primary suture may be done on the second, the third, or the fourth day. If infection occurs, it is well that primary suture has not been done.

In doing secondary sutures of soft tissues it is important to suture muscle aponeuroses in order to prevent herniæ of the muscles. Immediate closure of a defect in the cranium is apt to be attended with danger of meningitis. In injuries of the chest it is necessary to close the wounds as soon as expedient in order to prevent permanent collapse of the lung. As this may not be possible on account of infection secondary suture must be used. In such cases the "tamponnement en bouton de chemise" which makes certain the hermetic sealing of the cavity and at the same time permits drainage is of value. In wounds of the abdomen early intervention is necessary. The installation of advanced dressing stations 2 or 3 kilometers from the front reduced the mortality in abdominal wounds from 65 to 45 per cent.

The author dwells considerably upon the control of the infections of wounds by the bacteriological curve. When this curve comes down to zero, secondary suture is always safe. When slides and cultures show infection, suture will almost invariably be followed by failure.

GATEWOOD.



# GYNECOLOGY

## UTERUS

**Lewis, W. M.: Complete Inversion of the Uterus.**  
*California State J. Med.*, 1919, xvii, 251.

Lewis reports two cases of complete inversion of the uterus. In the first, the first and second stages of labor were short and normal. The third stage was slow, the patient being completely anesthetized with chloroform. While palpating the uterus the author felt it give way. This was followed by the appearance of the placenta and inversion of the uterus. There was no hemorrhage. The patient being completely relaxed, reposition was easily effected. There was no shock and there had not been any effort to expel the placenta. The cord was of the usual length. No traction had been made upon it.

In the second case, the labor had been long and was terminated by forceps in the second stage. A living child was easily delivered and the placenta promptly followed. In a few minutes the patient became conscious and complained of uterine pain. Inspection revealed the fact that the uterus was inverted. Reposition was effected easily with the aid of ether anesthesia. There was no hemorrhage but the shock was profound. The patient has had a subsequent labor without any difficulty.

W. F. HEWITT.

**Moore, G. A.: Tuberculosis of the Cervix Uteri; with Report of a Case.** *Surg., Gynec., & Obst.*, 1919, xxix, 1.

The chief reason for the apparent general lack of interest in this subject is the invulnerability of the cervix to invasion by the tubercle bacilli. Primary tuberculosis of the cervix is an extremely rare disease. Probably not more than 15 or 20 cases have been reported.

Of the secondary tuberculous infections of the cervix, probably about 150 cases have been reported. These represent only a small percentage as undoubtedly many have not been suspected or have been diagnosed as cancer, syphilis, etc.

Comparing the figures of Veyrat, Eden and Lockyer, and Williams, tuberculosis of the cervix occurs in about one-sixth or one-fifth of 1 per cent of all cases of pulmonary tuberculosis in women. The portal of entry of the bacilli still offers a wide field for study. In genital affections the bacilli are probably carried by the blood-stream more often than by any other route.

The next most common route of infection is by direct extension of a tuberculous process from the tubes, ovaries, or uterus, or by secretions from these organs passing over the cervical mucosa. The most frequent method by which bacilli are brought in

contact with the female genitalia from external sources is by coitus.

The varieties of cervical tuberculosis are classified according to their anatomic and microscopic forms as follows: (1) miliary, (2) interstitial, (3) vegetating, (4) ulcerating, (5) catarrhal form of Schutt, and (6) inflammatory form of Cotté. The last two are rare.

Clinically the diagnosis is in all cases difficult. All types and stages of the disease resemble carcinoma. Tuberculosis occurs most frequently, however, during the period of sexual activity, while cancer occurs as a rule in persons who are past middle life.

The appearance of the discharge is important. In the early stages it is glairy mucus, later becoming frank pus or streaked with blood, especially after coitus or examination. This differs markedly from the blood-stained serum of carcinoma. The pain is slight and indefinite.

The case reported was as follows: The patient, aged 27, came for examination only on account of hemorrhage. Her history was negative. The cervix was moderately large, soft, and patulous. The os admitted the examining finger. About the os, especially on the posterior side, a nodular roughness was felt. The examining finger was slightly stained with blood. On examination with a speculum an area  $\frac{1}{2}$  inch in width, bright red in color, and containing a small ulcer on the posterior side was found about the os. In the wall of the visible portion of the canal were a few small grayish and yellow nodules or large papules. The uterus was normal in size and freely movable. The adnexa and urine were also normal.

Examination of specimens from the cervix showed tuberculosis. The frequency of tubal involvement in all genital tuberculosis influenced the decision in favor of panhysterectomy. Microscopic examination of the uterus and appendages showed tuberculosis of the tubes, the fundus of the uterus, and the cervix. The process was oldest in the tubes where there was caseation in addition to giant-cell formation and an accumulation of many endothelial cells. In the uterus and cervix, the process was limited to the mucosa and consisted of the formation of fairly numerous miliary tubercles. The underlying muscle tissue was not involved in the slightest.

The patient was last seen Oct. 18, 1917. Her health was excellent, but she complained of a very foul leucorrhœa. Abdominal examination was negative. Vaginal examination revealed considerable induration of the vault of the vagina but no ulceration. Apparently there was a recurrence of the tuberculous process.

EDWARD L. CORNELL.



**Stein, A.: The End-Results in More than One Hundred Operations for Uterine Myoma; Operation Versus Roentgen-Ray Treatment.** *J. Am. M. Ass.*, 1919, lxxiii, 95.

The author does not deem the roentgen-ray treatment of uterine myomata a safe procedure for the following reasons:

1. It is impossible to determine whether the growth to be dealt with is a benign or a malignant tumor.

2. His statistics show that about 50 per cent of all cases of myoma are complicated by pus tubes, hydrosalpinx, hæmatosalpinx, acute or subacute appendicitis, ectopic pregnancy, etc.

3. In young women who have not reached the menopause, the roentgen-ray is almost certain to destroy the function of the ovaries and result in a premature menopause.

4. The continued application of the roentgen-ray is apt to have a deleterious effect upon the intestinal mucosa.

5. His experience has demonstrated surgical treatment to be the safest (with a mortality of only 3.5 per cent), the quickest, and most reliable method.

EDWARD L. CORNELL.

**Ribas y Ribas: The Treatment of Uterine Cancer** *Tratamiento del cancer del utero). Rev. españ. de cirug.*, 1919, i, 317.

The author summarizes his paper as follows:

1. Uterine cancer when treated early is curable. The removal of all causes of chronic irritation and the extirpation of precancerous lesions will diminish the frequency of the condition.

2. Curative treatment depends upon early diagnosis. It is urgent, therefore, to extend popular knowledge. Women ought to know that every discharge from the genital organs should be investigated. An opportune examination may save life. Early diagnosis and the most radical and early surgery are imperative in the treatment of uterine cancer.

3. The clinic ought to profit from the modern biological study of cancer. The biology of the malignant cell and of the disturbances of cellular metabolism give the key to the success or failure of treatment.

4. Radiotherapy and roentgenotherapy have acquired great importance, but further proof is required regarding the efficacy of these methods.

5. Experience has demonstrated that the results obtained from radium after curettement and disinfection of the neoplasm are: (1) excellent and durable in incipient cancer of the body of the uterus; (2) good, but only temporary, in extensive cancer of the corpus; (3) surprising and rapid in cancer of the cervix and in some cases permanent; (4) fair or poor in the atrophic and sclerosing types.

6. Cervical cancers cannot be regarded as cured even after a smooth and solid healing has been obtained as many cases after remaining cured for even a year or more show infiltration of the parametrium.

7. Radium applied in the uterus or in the vagina does not act upon parametrium infiltrations, nor is the action of the X-rays any greater. The author has not seen a single case of permanent cure of cancer effected by these means.

8. In uterine cancer benefit is obtained only by constant treatment.

9. The action of radium is not innocuous. The same dosage continued for the same length of time is not applicable to all forms of cancer. Owing to resorption the products of cellular autolysis rapidly provoked may be disastrous to patients with deficient emunctory power.

10. Recent biological methods—serotherapy, vaccine therapy, chemotherapy—do not yet warrant definite conclusions.

11. The author always employs radium and the X-rays either singly or combined after every surgical operation, applying them either in the interior of the uterus or in the pelvis. Radium may convert inoperable cases into operable cases. The exclusive use of radium or of radium with the X-rays he reserves for cases in which operation is not accepted or is contra-indicated.

W. A. BRENNAN.

**Jayle, F., and Halperine, I.: Cancer of the Corpus of the Uterus of Placental Origin; Chorio-Epithelioma** (Le cancer du corps de l'utérus d'origine placentaire; chorio-épithélioma). *Presse méd.*, Par., 1919, xxvii, 381.

During the period of genital activity the mucosa of the corpus of the uterus is practically immune to cancerous degeneration although the cervical mucosa is frequently attacked. After the menopause this immunity disappears. On the other hand, a particular variety of cancer of special origin may develop in the uterine corpus. This variety is not autochthonous like ordinary cancer and does not originate in the mucosa; it is a grafted cancer originating in the elements of implantation of the fecundated ovum and following pregnancy, most frequently a pregnancy of irregular type (molar pregnancy). This cancer has borne a variety of names, varying from the "malignant metastatic deciduoma" of Sanger (1888) to the present appellation "cancer of the corpus of the uterus of placental origin," which the authors propose as the most fitting.

Uterine cancer of placental origin has a special clinical development dominated by two symptoms: (1) cataclysmic hæmorrhages, and (2) numerous metastases. The study of the placenta, especially the chorionic villi, and of histologic sections of the tumor explains this particular symptomatology.

In the normal state the chorionic villi are endowed with a remarkable power of penetration and destruction. After the expulsion of the placenta the débris of the villi disappears, but if for some reason, which is still unknown, the villi continued to live, their proliferation is not stopped and a tumor is the result.



The authors discuss in detail the histologic aspects of the chorionic villi and illustrate their remarks by a number of plates. Vascular invasion by the neoplastic process is typical and always observed in the sections. The presence of vascular thrombi is also a histologic character of such tumors. This vascular invasion and destruction is the most striking characteristic, but is not generalized if the tumor is removed early.

In a case reported, that of a woman 35 years of age, a primipara whose most striking symptoms were cataclysmic hemorrhages, a hysterectomy was performed about five weeks after the onset of the symptoms. Sections from the removed uterus showed the intravascular vegetations clearly. In this case the authors believe it must be admitted either that the thrombus had not yet become free or that it was destroyed by phagocytes as happens when a thrombus arises from the normal placenta of a normal pregnancy. They prefer the latter explanation.

The cause of the degeneration of the chorionic villi is still unknown. It is surmised that it is to be found in heredity and that a clue is given by the patient's history of syphilis. W. A. BRENNAN.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Carstens, J. H.:** The Desirability of Preventing Sterilization in Young Women When Operating for Tuberculous Peritonitis. *J. Am. M. Ass.*, 1919, lxxiii, 23.

After considerable experience with abdominal operations, the author found that tuberculous peritonitis is usually cured by a celiotomy. The simple opening of the abdomen without doing anything else, without removing anything, and without irrigation, has sometimes resulted in a cure.

It has become a custom with some surgeons when operating for tuberculous peritonitis to remove the tubes whether there is mixed infection or not, simply to close an avenue for the entrance of tubercle bacilli which were supposed to be poured out from the tubercles in the peritoneal cavity. The author has protested against this practice for many years because the tubercles in the peritoneum are all absorbed in the course of time and it is his belief that those on the tubes and uterus will also be absorbed.

It has been asserted that in operating for appendicitis it is often found that the trouble is of tuberculous origin. In that case the author always removes the appendix and would also remove the tubes if the nidus of the disease seemed to be there. He removes the appendix in all these cases because it is dangerous to leave it behind. As the result of the tuberculous infection, adhesions, twisting, and kinking of the appendix often occur which in the future would be apt to cause an acute inflammation even after all tuberculous deposits had disappeared. In the case of the tubes this danger does not exist. The patients are nearly all young women, perhaps un-

married, or married only a short time, and to remove the tubes and thus deprive them of the opportunity of motherhood, he considers a bad practice.

EDWARD L. CORNELL.

**Ries, E.:** Alternating Periodic Ovarian Swellings. *J. Am. M. Ass.*, 1919, lxxiii, 100.

There are four types of cases which may be properly considered under this head.

1. The vanishing tumor. On examination, a cystic tumor the size of a hen's egg or larger is found at the side of the uterus. The patient may have had some irregularity of menstruation and some pain. At operation one ovary shows a ruptured cyst, the thin walls of which on examination prove to be those of a cyst of the corpus luteum with more or less of a lutein layer in its walls.

2. The false extra-uterine pregnancy. A patient with irregularity of menstruation, at times exactly of the type which occurs in extra-uterine pregnancy, presents a soft, cystic tumor at the side of the uterus. At operation, instead of an extra-uterine pregnancy, a cyst of the corpus luteum in one or both ovaries is discovered, usually with a thick lutein cell layer and often associated with the presence of chocolate-colored hemorrhagic contents in one or both ovaries. With the removal of the cyst or cysts all symptoms promptly cease.

3. The tumor which disturbs the peace of the community. The patient consults Dr. A. in regard to certain pains in the abdomen, with or without much menstrual disturbance. The physician tells her she has an ovarian cyst on the right side and should have it operated upon. After a few days the patient consults Dr. B. for confirmation of the diagnosis. He examines her and assures her that there is no tumor at all. The patient is now thoroughly disturbed and seeks the advice of a third physician, Dr. C. He examines her and tells her that she has an ovarian cyst; that it is not, however, on the right side, but on the left side. The amount of ill feeling created between practitioners themselves and their patients by such an occurrence may be readily imagined. In a case of this kind three years ago the author advised the patient not to have an operation for the time being and she is alive and well.

4. Alternating periodic ovarian swellings.

EDWARD L. CORNELL.

**Heineck, A. P.:** Herniæ of the Ovary, of the Fallopian Tube, and of the Ovary and Fallopian Tube. *Med. Times*, 1919, xlvii, 161.

The fallopian tube, the ovary, or the tube and ovary, in part or in their entirety, may be herniated. The degree may vary from a complete descent of the tube, ovary, or tube and ovary, into a hernial sac, to a condition in which the herniated viscus or viscera lie just outside the abdominal ring. The herniated organ or organs may be normal or present degenerative changes of an atrophic, inflammatory, or neoplastic character.



Herniæ of the uterine adnexa are often overlooked and not uncommonly misdiagnosed. They may therefore be subjected to injudicious treatment, harmful alike to the patient's general well-being and her reproductive capacity.

The herniated tube, ovary, or tube and ovary may be the sole content of a hernial sac or there may be present as associated hernial contents one or two or more of the following structures or organs: Meckel's diverticulum, appendix vermiformis, omentum, urinary bladder, small or large intestine, rudimentary or fully developed uterus.

Tubal, ovarian, and tubo-ovarian herniæ are congenital or acquired, unilateral or bilateral. If in the female an inguinal hernia first appears late in life, it is difficult to state with absolute accuracy that an incompletely obliterated canal of Nuck did not predispose to its occurrence. Such herniæ may exist alone or may be associated with one or more others of similar or dissimilar anatomical type and of similar or dissimilar clinical characteristics.

In a small proportion of cases the herniæ co-exist with malformations, underdevelopment, or absence of other internal or external genitalia.

In a woman with a herniated tube, a herniated ovary, or a herniated tube and ovary, pathologic states of other internal genitalia or of some external genitalia may be present—vaginitis, ovarian cystoma, uterine fibroid, uterine prolapse or other uterine displacements, etc.

Tubal, ovarian or tubo-ovarian herniæ may co-exist also with pathologic states of organs other than the internal or external genitalia—chronic hydrocephalus, multiple stenosis of the intestines, hydro-nephrosis, etc.—which do not have any relation of cause or effect to the hernia.

Congenital or acquired herniæ of the tube, ovary, or tube and ovary, may become manifest at any period of life. Such herniæ have been observed in nulliparæ, primiparæ, and multiparæ.

Tubal, ovarian, and tubo-ovarian inguinal herniæ are recent, old, and recurrent, direct, interstitial, or intraparietal, indirect or oblique. If indirect or oblique, they are either complete or incomplete. A few sliding herniæ are on record.

All the bilateral tubal, ovarian, or tubo-ovarian herniæ recorded in medical literature of the last twenty years were of the inguinal variety, while all the femoral tubal, ovarian, or tubo-ovarian herniæ were of the acquired type and appeared in advanced adult life. In the absence of anomalies of the non-herniated internal genitalia or the external genitalia, herniæ of the uterine appendages do not prevent conception, interfere with gestation, or unfavorably influence parturition if the herniated adnexa are normally developed, free from disease, and reducible. Pregnancy may occur previous to, during, and subsequent to, the existence of herniæ of this nature.

The etiology of herniæ of the uterine appendages is that of hernia in general.

Truss treatment for hernia of the uterine appen-

dages is not curative and is often productive of discomfort. Not infrequently it interferes with the nutrition and development of the herniated tube or ovary.

After the second year of life, spontaneous cure of herniæ of the uterine adnexa is rare and can occur only if the hernial contents are easily reduced and easily kept reduced.

All adnexal herniæ, irrespective of the patient's age and of their anatomical site and size, should be subjected to an operation for radical cure: (1) if the hernia is irreducible; (2) if the hernia is strangulated; (3) if the pedicle is twisted.

After the age of 2 years an operation should be performed (1) if the hernia is bilateral; (2) if other herniæ co-exist; (3) when the hernia cannot be painlessly, completely, and permanently reduced; (4) if organs other than the uterine appendages are also present in the same hernial sac; (5) if the wearing of a hernial ring truss causes pain or aggravates the symptoms; and (6) if the patient has to be subjected to ether, chloroform, or other general surgical anæsthesia for the performance of some other operation, in which case advantage can be taken of the opportunity to perform an operation also for the radical cure of the hernia.

It is unwise to sacrifice a normal herniated tube or ovary.

EDWARD L. CORNELL.

## MISCELLANEOUS

**Echols, C. M.: Common Gynecologic Errors.** *Wisconsin M. J.*, 1919, xviii, 5.

The following procedures and practices are discussed at length and condemned:

1. Routine curettage after spontaneous abortion, irrespective of definite indications.
2. Too early operation upon vesicovaginal fistulæ after confinement.
3. Operations to cure sterility in women without adequate investigation to determine its cause.
4. Failure to palpate the gall-bladder in routine laparotomies for chronic conditions.
5. The assumption that a woman has not had gonorrhœa because there is no definite history of an acute attack.
6. Mistaking tubal pregnancy for threatened or incomplete abortion.
7. Examining patient for cystocele and prolapsus uteri without having her stand upright during at least a part of the examination.
8. Hysterectomy for prolapsus uteri (atrophic uterus) in older women.
9. Routine operations for simple retroversion of the uterus.
10. Failure to suspect and investigate for malignancy during irregular bleeding near the menopause.
11. The readiness of some surgeons to resort to cæsarean section without legitimate indications.
12. Too many hysterectomies and not a sufficient number of myomectomies for fibroid tumors in women under 35 years of age.



**Child, C. G., Jr.: Co-existent Diseases of the Appendix and Pelvic Organs in the Female.** *Am. J. Obst.*, 1919, lxxx, 31.

Disease of the pelvic organs in the female is an important exciting cause of appendicitis, and to a lesser extent the appendix may be a cause of adnexal disease on the right side.

In by far the greater number of cases of co-existent pelvic disease and appendicitis the primary source of infection is in the pelvis.

Involvement of the appendix is nearly four times more frequent in adnexal disease on the right than on the left side.

As the possibility of an involved appendix should always be borne in mind when operating upon diseased adnexa, so also should the possibility of diseased adnexa be remembered when operating upon the appendix.

An appendix may be macroscopically pathologic yet not microscopically diseased, and vice versa, and should always be removed, if possible, when the abdomen is opened.

Appendicitis in the female is associated so frequently with pelvic disease that it should always be considered as a gynecological condition.

EDWARD L. CORNELL.

**Hopkins, A. H.: Climacteric Hypertension: a Study of High Blood-Pressure During and Following the Menopause.** *Am. J. M. Sc.*, 1919, clvii, 826.

The author refers to several investigators who have suggested that hypertension is not always a result

of arteriosclerosis or nephritis but may be a primary factor in bringing about the former or the result of such conditions as over-eating, the presence of pus pockets at the roots of teeth, etc.

He cites a series of 51 cases of hypertension which came under his own observation and in which the condition occurred in women at the time of, or following, the menopause. In most of these cases the women belonged to the upper strata of society and were high strung, energetic, robust, and well fed, some even inclining to obesity. He suggests that these cases might be styled "endocrinal hypertension" and believes they are examples of the only true "benign" hypertension. As evidence that they are unlike cases of high blood-pressure in men of middle age or past, or in women with causative factors in their past medical histories, he reports that in these instances there was little retinal sclerosis except in advanced stages of the disease, that anemia was present only exceptionally, and in the renal functional tests there were only slight traces of albumin, few casts, and practically no impairment of phthalein elimination.

The author reviews the parts played by the various endocrine organs concerned and their dependence upon one another in keeping the body in normal condition during the years of sexual potency. In explanation of his term "endocrinal hypertension" as applied to the 51 cases reported he says that they are due to the withdrawal "of at least a part of the secretion of the ovary" at the time of the menopause, with the addition of emotional disturbances, often profound, which leave "the adrenals, hypophysis, and thyroid out of balance."

C. M. GRUBER.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Davis, E. P.** *The Nourishment of the Pregnant Woman.* *Am. J. Obst.*, 1919, lxxx, 23.

Undoubtedly the appetite of the absolutely healthy woman is quickened by pregnancy. Vomiting must be considered as pathologic and unnatural; also abnormal cravings for acids and highly spiced and strongly flavored foods.

To what extent should meat be used as proteid food by the pregnant woman? Unquestionably excess in this matter produces a large, overgrown, and unduly hard foetal skeleton. A fair average may be obtained if the so-called "red meats" are eaten but once or twice weekly and the proteid obtained in other forms.

Eggs are usually well digested during pregnancy but often are considered as among the very light and unimportant articles of food. In permitting a pregnant woman to eat eggs it must be remembered that they are highly nitrogenous and nutritious.

Proteid contained in fish of all sorts seems often to be better assimilated than that of animal flesh. The fact that proteid matter of great value is contained in vegetables is often overlooked.

It is interesting to observe that the patient who has been digesting proteid material badly during the early stages of pregnancy will do much better as the pregnancy approaches its termination. Often the approach of labor may be predicted from the improvement in nitrogenous metabolism.

It is customary to advise the pregnant woman to eat cereal foods and bread and butter in abundance, but often the fact is forgotten that in addition to these substances a considerable quantity of the proteids of fat may be taken and the combination may prove disastrous.

Especially valuable in pregnancy are the earthy salts and acids contained in vegetables and fruits. When indigestion is annoying and persistent, the juice of the fresh lime and that of the pineapple are of special value.

In determining the diet of pregnant women the very important part played by water must not be forgotten. When metabolism is deficient, however, water should not be drunk in such excess that the kidneys are overcome. A pregnant woman can better dispense with coffee than with tea and is well off without either. Excessive amounts of tea tend to produce constipation and an obstinate form of intestinal catarrh. Alcohol as a food substance is not needed by the healthy pregnant woman. The use of malt extracts during pregnancy is rarely recommended.

Economic conditions are a most important factor in determining the nutrition of the pregnant woman.

If she is to be well nourished conditions must be such that she can be given pure food properly prepared.

The vexed question of obtaining servants and help for the pregnant woman in procuring and preparing her food should be met by municipal aid. This should include the establishment of a market house or a market on the curb where food of good quality can be procured at moderate price. If through weakness or ignorance the patient is unable to prepare her food properly, a community kitchen to which she may send it for preparation or from which she may obtain it properly cooked would be of practical value.

EDWARD L. CORNELL.

**La Torre, F.:** *Intra-Uterine Death of the Fœtus* (La morte intra-uterine del feto). *Clin. ostet.*, 1919, xxi, 93.

In his discussion of the intra-uterine death of the fœtus, the author considers the causes, the diagnosis, the prognosis, and the treatment.

The diagnosis depends upon: (1) signs arising from palpation; (2) signs perceived by means of auscultation; (3) signs perceptible from vaginal examination. Reviewing all such evidence La Torre concludes that there is no one sign which of itself indicates foetal death positively but that when they are all taken together such signs may be considered as definite. Only two signs are of any absolute value as indicating life, i. e., active movements of the fœtus and the presence of a double cardiac beat. If either or both have been demonstrated, but are not recorded for some time, it is a certain indication of foetal death.

With regard to intra-uterine retention of a dead fœtus the author states that it is generally agreed that a dead fœtus may be retained for nine months as if the pregnancy had not been interrupted but had continued to develop. A number of cases are cited from the literature in which a dead fœtus was carried in the uterus for periods varying from several months to even a few years after the foetal death, and also cases in which it had never been expelled. This leads the author to the discussion of maceration, mummification, etc., and their effects upon the mother.

Under the heading of treatment, La Torre considers principally what has been called "habitual death" of the fœtus, an occurrence which may be considered as due to syphilis of the progenitors. The treatment in such cases should consist in antisyphilitic treatment of the parents.

When premature still-births are habitual within a short time before term La Torre advises provoking labor a few weeks before the spontaneous birth of a dead fœtus is expected.



Other cases of premature still-births may be traced to alcoholism and other intoxications of the parents as well as to lacerations of the cervix and endometritis. The interruption of pregnancy in such cases may be obviated by suitable specific treatment. La Torre has reported cases in which amputations of the cervix or trachelorrhaphy caused the cessation of premature interruption of pregnancy.

W. A. BRENNAN.

**Appleton, P.: Premature Separation of the Placenta.** *Boston M. & S. J.*, 1919, clxxx, 718.

After defining premature separation of the placenta and giving some statistics showing that this condition occurs more frequently than has been taught heretofore, Appleton discusses the etiology in detail. He does not consider constitutional diseases of much consequence as predisposing causes, but disease of the placenta itself is nearly always present. The direct causes he lists are trauma, shortness of the cord, and rapid evacuation of the fluid in hydramnios.

A careful description is given of the types of premature separation and the clinical course, with a discussion of the signs and symptoms upon which the diagnosis may be based.

Since the prognosis is always grave for the child and very serious for the mother, it is recommended that the uterus be emptied as rapidly as possible under the circumstances, and especially that adequate help be at hand (preferably a competent consultant), since in the event of the delivery of a living child, the latter will need immediate attention as well as the mother.

F. H. HARMS.

**Heaney, N. S.: An Analysis of the Signs and Symptoms of Early Ectopic Pregnancy.** *Am. J. Obst.*, 1919, lxxx, 17.

More attention should be given the early cases of unruptured ectopic pregnancy. In most textbooks now used so much emphasis is placed upon advanced and critical cases that the student does not suspect ectopic pregnancy except in the unusual or exaggerated case. Unless a woman is in imminent danger of losing her life the possibility of ectopic pregnancy is very apt not to be considered.

To emphasize the severity of the pain as the significant feature is like dwelling upon the emaciation in cancer of the uterus. To await it in an otherwise clear case is to court disaster. Every patient presenting herself with the suspicious symptoms of a threatened, imminent, or incomplete abortion should be examined with the possibility in mind that the condition may be ectopic pregnancy, more especially if the cramps are located in the side of the pelvis instead of over the uterus.

Another point which is over-emphasized is the passage of a cast of the uterus or of smaller portions of the decidua.

Great care is taken to teach that the uterus enlarges in ectopic pregnancy. Taking cases as they come, operation reveals some enlargement of the uterus in a considerable percentage but a large

number show no appreciable increase in size and indeed frequently the uterus is smaller than normal, since when the uterus and tubes are undeveloped pregnancy is especially apt to be ectopic if it occurs at all.

Extra-uterine pregnancy is said to produce an enlargement of the appendages which may be felt at the side of the uterus. Such an enlargement may be found if the pregnancy has existed long enough to produce palpable swelling, but frequently rupture occurs before that time. The failure to palpate a supposed gestation sac in a case of shock and pain should deter us from operating upon an otherwise clear case of ectopic pregnancy.

The symptoms of a ruptured tube are also too encyclopedically portrayed. The evidence of rupture is given as extreme pain of a tearing or stabbing character, followed by shock, pallor, cold sweat, weakness, nervousness, increased pulse rate, increased respiration, falling of the hæmoglobin and red-cell count, air hunger, dullness of the flanks, and distention of the abdomen.

Not sufficient emphasis is placed upon the fact that the severity of the symptoms depends upon the amount of blood lost, not merely upon the rupture of the tube. If only small vessels have been torn, or if the tear is incomplete, the patient will have sudden pain, not necessarily prostrating, followed perhaps by some nausea and weakness.

The condition of any woman of obstetrical age who is seized with an abdominal pain of severity followed by shock or syncope, even if transient, must be regarded as possibly due to ectopic pregnancy until proved otherwise.

A leukocytosis with a normal or subnormal temperature should lead to the diagnosis of probable ruptured ectopic pregnancy when there has been severe abdominal pain followed by nausea and perhaps vomiting.

The author advocates wider teaching regarding the advisability of exploratory vaginal incision in doubtful cases. If a case is sufficiently suspicious to be in a hospital it is sufficiently suspicious to warrant a definite decision as to whether an ectopic pregnancy is present or not. In this class of cases a decision can be easily reached by vaginal incision. If there is no ectopic pregnancy the danger to the patient is slight and is compensated by the accuracy of diagnosis.

EDWARD L. CORNELL.

**Rawls, R. M.: Report of a Case of Full-Term Ectopic Pregnancy.** *Am. J. Obst.*, 1919, lxxx, 53.

The patient, aged 19, was operated upon and a macerated female infant weighing 9¼ pounds was delivered. There were all the signs of maturity and no caput succedaneum. The placenta showed two portions, one of which measured 15 centimeters in diameter and about 3 centimeters in thickness. The maternal side showed a very short, thick pedicle which was apparently composed of musculature. This thicker portion of the placenta went over into a thin, disc-like structure measuring 18



by 12 centimeters and about 1 centimeter in thickness. The maternal part of the latter was smooth. The membranes were attached to the placenta. The umbilical cord showed serohæmorrhagic imbibition.

Microscopically sections from the pedicle showed an oedematous smooth musculature. Other sections showed placental tissue, some of it attached to thin strands of smooth musculature, probably tubal. No sections showed mucosa, and there was no evidence of uterine musculature. Most of the placental villi were macerated, and many degenerated.

The section of the infant showed a serohæmorrhagic transudate in the abdominal, the pleural, and the pericardial cavities. The cheeks and eyelids showed marked anasarca. The brain itself was macerated and extremely soft. There were no anomalies in the internal organs.

EDWARD L. CORNELL.

**De Lee, J. B.: The Newer Methods of Cæsarean Section; Report of Forty Cases.** *J. Am. M. Ass.*, 1919, lxxiii, 91.

The classic cæsarean section has come to be one of the safest of laparotomies and is widely practiced. Undoubtedly, however, it is too widely practiced, the trust in its general safety being too great.

Accoucheurs of experience know that cæsarean section is not so safe. There is an unavoidable mortality which increases with: (1) the length of labor; about 1 per cent every two hours; (2) the number of vaginal examinations made or operations attempted; (3) the rupture of the membranes; and (4) the lack of skill of the operator. Furthermore, there are certain women who carry infection in the vagina—harmless there, but fatal if brought on to the peritoneum.

In infected, or possibly infected, cases of obstructed labor, craniotomy is the only alternative since pubiotomy is too dangerous. It was to reduce the necessity of this horrible operation that the newer methods of cæsarean section have been developed.

Attempts to improve the classic cæsarean section, to make it adaptable to the neglected cases failed until 1906 when Frank, of Bonn, disinterred the old extraperitoneal methods.

Today there are about twenty different procedures which may be divided into two classes: first, the transperitoneal, or perperitoneal, and second, the extraperitoneal. Among the transperitoneal cæsarean sections, that devised by Kroenig and modified by Gellhorn of St. Louis seems to be the most advantageous and is used in cases in which infection is suspected.

No one of experience will contest the statement that at the present time 2 per cent of patients undergoing a clean, non-toxic cæsarean section die. Does the cervical cæsarean section reduce this mortality?

The author and his assistants operated in 46

cases without any foetal or maternal deaths. Theoretically and practically there are many reasons why the results were so successful. The incision was made in the lower part of the uterus, the cervix, which it is well known resists infection. The same may be said of the lower abdomen which resists infection better than the upper; hence, the value of the Fowler position in cæsarean section. When the incision is made in the cervix the uterine wound is at rest, lochia is not squeezed through it by the after-pains, and should a leak occur in the line of suture, it will be under the peritoneum, between the bladder and the cervix, where it may be reached easily in three ways: by the cervix; between the cervix and the bladder—a simple anterior colpotomy; or by opening the lower corner of the abdominal wound. If, when the incision is made in the corpus, infection wanders along the line of suture as it often does, it at once reaches the peritoneal cavity; in the cervical section it reaches a safer area, one more easily drained.

Another element of safety in the method used by the author is the entire absence of any necessity to handle the intestine. Often the bowel does not even come into view. Moreover, liquor amnii, vernix caseosa, and meconium do not soil the peritoneum.

The convalescence after the cervical cæsarean section is, without question, smoother than that following the classic section. Of the author's 31 cases, there was suppuration in only 1, which is most noteworthy since in 9 there was a slight suspicion of infection.

When the cut is made in the body of the uterus uterine rupture in subsequent labors is more apt to occur as the wound surfaces are not at rest during the healing process. With each after-pain the sides of the wound grind on each other and even in the absence of infection are prone to unite. When the cut is made in the cervix, all this is absent. The wound is at perfect rest.

For the old, or classic, cæsarean section, the author has to have special indications, and these are, usually, the necessity for instant delivery, the desire to remove fibroids, placenta prævia, when a Porro operation is to follow, and in the case of an extremely pendulous abdomen. Experience may prove it possible to omit some of these exceptions.

The choice between extraperitoneal and transperitoneal methods is still undecided, but the majority of operators prefer the latter.

In the presence of insuperable mechanical disproportion, that is, the absolute indication for cæsarean section, it was possible for the older obstetricians to perform only a therapeutic abortion or a classic cæsarean section at term if the condition was discovered in time. If the dystocia was experienced only after infection was present or suspected, a Porro or complete uterine extirpation was demanded in order to save the woman's life.

Today the procedure is different. Therapeutic abortion is absolutely contra-indicated. At full



term there are four courses from which to select: the classic cæsarean section, the classic cæsarean section with the Porro modification, the transperitoneal cervical section, and the extraperitoneal section. In clean and in suspected cases the author recommends the transperitoneal cervical section, and in frankly infected cases, the extraperitoneal or Porro cæsarean section.

In the treatment of labor in pelves that are not so markedly contracted, the plan has become more simplified in recent years. Unless the patient positively demands the induction of premature labor, the pregnancy is allowed to go to full term. Just before labor begins, a careful rectal and abdominal examination is made to determine whether or not there is any chance that the fœtus will pass through the pelvis. The transperitoneal section is performed as soon as labor is well under way. If there is reason to believe that the head will go through, the patient is given a real test of labor. If delivery is impossible, the transperitoneal section is done in the cases of primiparæ and either this or pubiotomy in the cases of multiparæ, the surgeon being guided by the individual conditions. This statement holds also for cases in which infection is suspected. In infected cases, the author still fears to perform an abdominal delivery in spite of the wonderful results recorded by European operators. If this is necessary, he recommends the extraperitoneal method with free drainage in the cases of young women, and uterine extirpation in the cases of the old.

In placenta prævia De Lee prefers the classic operation. In abruptio placentæ, the transperitoneal is the method of choice unless great speed of delivery is required to save the child. For neglected shoulder and breech presentations, prolapse of the cord, and the innumerable other obstetrical complications, the new operation will find a restricted field of usefulness.

EDWARD L. CORNELL.

**Markoe, J. W.: Cæsarean Section Following a Previous Extraperitoneal Cæsarean Section.** *N. York M. J.*, 1919, cix, 1022.

The author reports in detail an extraperitoneal cæsarean section with the unusual sequence of a classic cæsarean section fifteen months later upon the same patient. The extraperitoneal cæsarean was performed after repeated vaginal examinations outside the hospital and after the membranes had ruptured and the woman had been in labor for forty-eight hours. Infection was strongly suspected as cultures from the cervix before vaginal examination showed a mixed infection of colon bacilli and non-hæmolytic staphylococci.

Markoe employed the median incision from the symphysis to the umbilicus, incising fascia and muscle and stripping the tissues containing the bladder up from the left side with dry gauze sponges. Great care was taken not to enter the peritoneal cavity. Upon reaching the uterus the stripping was continued until a sufficient area of the anterior wall

of the cervix was exposed for the delivery of the child. The bladder and peritoneum were then held well to the right by an assistant, the uterus incised, and the head delivered first by using one blade of the forceps as a vectis. After a rapid delivery of the child and manual extraction of the placenta and membranes the uterus was sutured with interrupted chromic catgut sutures, the bladder and peritoneum replaced unopened and fastened to the left side with one suture, a deep rubber drain inserted in the left side, and the wound closed with interrupted sutures of chromic gut in the fascia and clips in the skin.

As on the following day the wound was found to contain pus, two No. 5 Carrel tubes were inserted deep into the left side and two others were placed on the wound surface, surrounded by gauze wet in Dakin solution. The nurse was instructed to allow a small amount of the fluid to soak into the dressing through the Carrel tubes. Results not being secured by this method, the wound was flushed every two hours with 100 cubic centimeters of Dakin solution. This latter procedure so reduced the bacterial count that twelve days after operation all tubes were removed and the wound was closed.

Fifteen months later the patient entered the hospital at term and a classic cæsarean section was performed. Before opening the uterus an exploration of the peritoneal cavity revealed a total absence of adhesions in the region of the bladder, cervix, and broad ligaments. Later an inspection from within the uterine cavity of the site of the cervical opening made at the time of the extraperitoneal operation showed only normal uterine tissue with no sign of scar.

Markoe believes that the entire absence of weakness in the abdominal wall in spite of the necessary closure following suppuration was due to the median incision as the muscles have a strong tendency to come together in the median line and in consequence a firmer union of the fascia and muscle fibers is obtained, particularly following suppuration. In the classic operation he passed two fingers from within the uterus through the internal os for the purpose of dilating the cervix sufficiently to avoid any retention of lochia.

In the author's opinion much may be hoped for in the technique described as an alternative for craniotomy or removal of the uterus.

H. K. GIBSON.

**Bruenner, K.: Cæsarean Section for Hæmorrhages Due to Vaginal Varices** (Kaiserschnitt wegen Blutung aus Varizen der Vagina). *Cor.-Bl. f. Schweiz. Aerzte*, 1919, xlv, 321.

Hæmorrhage due to rupture of vaginal varices is a formidable complication during pregnancy and labor, and particularly formidable in the latter. In a dissertation published in 1901 Delahouse collected 20 cases occurring in the course of labor. In these there were 11 deaths, 8 of which occurred in less than twenty minutes. Wullman reported 13 deaths in 15 cases which occurred during preg-



nancy and 7 in 16 cases which occurred during labor. Generally varices begin to be troublesome during the three last months of pregnancy and this is the usual time of rupture. The mortality of the condition runs up 50 per cent.

As a rule hæmorrhages due to vaginal varices are rebellious to the usual methods of treatment by ligature or tampons. When such a hæmorrhage threatens in the course of labor it is best to terminate the latter as rapidly as possible. The author has been able to find in the literature only 2 cases in which the labor was ended by a cesarean section, in one as a prophylactic and in the other as a therapeutic measure. In both instances the mother recovered.

Bruenner reports the case of a woman aged 38 years, a vi-para, whose previous labors had all been quite normal and without instrumental help, but were generally followed by pain in the bones and edema. In the labor reported delivery by forceps was attempted but during the manipulations there was a sudden profuse hæmorrhage due to the rupture of a packet of vaginal varices which interlaced the whole vaginal wall. The labia majora were involved and enormously swollen and the anal region was gorged with blood. Attempts to stop the hæmorrhage by means of hæmostats and ligatures and to complete the delivery by the forceps had no effect.

As the foetal heart sounds had become almost inaudible and the patient's pulse was weakening the author then determined to complete the labor by a transperitoneal cesarean operation. This was done without difficulty and the child, which was dead, was extracted. The vaginal hæmostatic forceps were removed one by one from forty-eight to seventy-two hours later. The hæmorrhage did not recur and the varices were at that time considerably reduced in volume. The onset of peritoneal infection was marked by the elimination of pieces of necrotic vaginal mucosa during the days following. The patient made a definite recovery after a short attack of pneumonia. In Bruenner's opinion a case of this kind is an indication for cesarean section.

As a prophylactic measure to guard against peritonitis in a transperitoneal cesarean operation on a uterus already subjected to obstetrical manipulations the author recommends intra-uterine tamponade with iodoform gauze through the uterine incision followed after suture of the incision by lavage of the peritoneal cavity with warm physiological salt solution. This was done in the case reported. The uterine tampon was withdrawn on the seventh day. Anti-streptococcus serum was also administered.

W. A. BRENNAN.

#### LABOR AND ITS COMPLICATIONS

**Child, C. G. Jr.: Episeotomy: Its Relation to the Proper Conduct of the Perineal Stage of Labor.**  
*Med. Rec.*, 1919, xcvi, 142.

Child reports a series of 166 cases—112 those of primiparæ and 54 those of multiparæ. Of the

54 primiparæ upon whom an episeotomy was performed, 3 failed to heal by primary intention. Of these, 2 were septic at the time of delivery. In 3 cases there was laceration because the incision had not been made large enough. Of the 58 primiparæ upon whom an episeotomy had not been performed, 18 (31 per cent) sustained lacerations in spite of all precautions. In two instances there was involvement of the sphincter ani. The operation was required in only 9 cases of multiparæ. One of these was a case of breech presentation and 3 were forceps cases.

The incision should be made on one side of the vulva and should go through the skin, the subcutaneous and adipose tissue, down to the levator muscle. The division of the muscle should be carried to a point just sufficient to allow the birth of the head. The extent necessary is gauged as the head advances with each pain.

In closing the incision interrupted silk-worm-gut sutures are the best and should be passed inward, taking up all tissue as far as the vaginal mucosa. The latter should be united by a continuous No. 2 chromic catgut suture. The sutures may be introduced while waiting for the placenta but should not be tied until after its expulsion.

The author strongly recommends the operation.

H. K. GIBSON.

**Williams, J. W.: The Tolerance of Freshly Delivered Women to Excessive Loss of Blood.**  
*Am. J. Obst.*, 1919, lxxx, 1.

The present study concerning the amount of blood lost during the third stage of labor and shortly thereafter and its clinical effects, is based upon observations made upon 1,000 consecutive spontaneous full-term labors which occurred in 1,339 obstetrical patients at the Johns Hopkins Hospital.

Three hundred and thirty-nine histories in the series were not utilized as they included 162 operative cases as well as 177 others in which pregnancy had terminated prematurely or the patients left the hospital before delivery.

After the child is born the uterus is gently palpated and the location of its fundus noted, but massage is not employed unless the uterus is boggy in consistency or the bleeding excessive. After the lapse of from five to thirty minutes it is usually noted that the uterus has risen 4 to 6 centimeters above its original location, while in some cases an indistinct swelling has likewise appeared just over the symphysis.

The author states that he has been unable to convince himself that there is any advantage in waiting a specified length of time before expressing the placenta. The typical Credé method of expression is employed only with the greatest circumspection and only in the presence of serious bleeding or after spontaneous separation of the placenta has failed to occur within one hour after the birth of the child.



Upon determining the amount of blood lost in 1,000 spontaneous labors, the average bleeding was found to be 343.7 cubic centimeters, with the extremes varying from zero to 2,400 cubic centimeters. In two cases the placental period was entirely bloodless. It must not be understood, however, that this average loss gives a correct idea concerning the amount of the bleeding most apt to be encountered in spontaneous labor. The latter amounted to less than 300 cubic centimeters in 527 out of 1,000 cases.

Not a few freshly delivered women lost excessive quantities of blood without presenting any evidence of shock, and occasionally the extent of the hæmorrhage would not have been appreciated if the blood lost had not been collected and measured.

Only one of the 31 women who lost between 1,000 and 1,250 cubic centimeters presented immediate symptoms attributable to loss of blood. This patient was considerably shocked and had a pulse rate of 118 one hour and a quarter after delivery. Only 4 of the 18 patients losing from 1,250 to 2,400 cubic centimeters caused any anxiety; none was seriously ill and all recovered.

It is currently believed that the pulse is unusually slow during the normal puerperium, and that the best method of evaluating the effect of hæmorrhage is based on its increased rate and poor quality. The observations reported, however, show that the first assumption is incorrect, and that in freshly delivered women, the second is not regular.

The average pulse rate was 91.66 in non-hæmorrhagic cases and 96.45 in hæmorrhagic cases, a fact which apparently indicates that the average effect of hæmorrhage is to raise the pulse rate by only 5 beats.

It is apparent that a certain proportion of freshly delivered women may lose from 1,250 to 2,400 cubic centimeters of blood with comparatively little danger and present such slight immediate symptoms that the extent of hæmorrhage might escape recognition if the blood were not collected and measured.

If the usual computation that the total amount of blood in the body corresponds to one-thirteenth of the total body-weight be accepted and if it is assumed that the latter averages 130 pounds, such hæmorrhages mean that the patients lost from one-quarter to one-half of their total blood. In males and non-pregnant women such a loss would inevitably be followed by alarming symptoms of shock and acute anæmia, yet the latter did not appear in any of the patients whose cases are here recorded nor was their general condition so serious that transfusion was at any time necessary.

In order to avoid any possibility of misunderstanding, the author emphasizes strongly that he does not claim that freshly delivered women are entirely immune to excessive hæmorrhage.

Twenty brief case reports are appended.

EDWARD L. CORNELL.

**Remy, S.: Remarks upon a Series of Twenty-four Breech Presentations** (Réflexions sur une série de 24 cas d'accouchements, l'enfant se présentant par le siège). *Rev. mens. de gynéc., d'obst. et de pédiat.*, 1919, xiv, 125.

The author reports first a series of 17 breech presentations which occurred in his own practice. In 13 of these the delivery was classical and the birth normal. Obstetrical intervention was required in 4 cases, in 3 for insufficiency of expulsive force and once for posterior rotation of the child's back as well as rotation of the head. In all 17 cases a living child was delivered, but a few of them required resuscitation.

From these cases the conclusion is drawn that when the uterine contractions are brisk and energetic, the breech and body of the child disengage easily and rapidly; the obstetrician has only to lower the arms, which is easily done, and aid in the expulsion of the head by the classic means. It is not correct to apply the term "dystocia" to such cases. Unfortunately, however, all breech presentations are not of this kind.

In 7 other cases of breech presentation, in which the author was requested to operate, extraction of the child was necessary owing to complications. In 2 cases the child was dead before any intervention could be effected. In 2 others, in which both of the women were primiparæ, the child died during the intervention. In both instances it was retained above the pelvis.

Of the total number of 11 cases reported in which an intervention was necessary eclampsia occurred in 4. In all of these, however, a living child was delivered.

Although in a case of breech presentation in a multipara with a small child extraction may be relatively easy, in other cases it may be a formidable operation entailing a high infant mortality. Therefore, whenever possible, it is best by external manœuvres to transform a breech presentation into a head presentation during the pregnancy.

W. A. BRENNAN.

## PUERPERIUM AND ITS COMPLICATIONS

**Jullien: Kidney Decapsulation in Puerperal Eclampsia** (À propos de la décapsulation rénale dans l'éclampsie puerpérale). *Rev. mens. de gynéc., d'obst. et de pédiat.*, 1919, xiv, 131.

In reporting a case of puerperal eclampsia in a woman aged 25 years upon whom the author did a bilateral kidney decapsulation followed by ultimate recovery after cystitis and a right pyelonephritis, he states that it is difficult to lay down any precise rule for the treatment of a disease like eclampsia as it presents so many different types. The most severe and alarming cases may recover almost spontaneously.

Too much must not be expected of a kidney decapsulation. It can do nothing for alterations in the liver and brain but is sovereign where the



urinary secretion is concerned. Statistics prove that the secretion of urine is re-established by kidney decapsulation in 80 per cent of the cases although in spite of surgical treatment the mortality due to eclampsia is still about 40 per cent. However, decapsulation has been practised only in the gravest cases not amenable to more simple methods.

All eclamptic patients ought not be submitted to surgical treatment. Only one class has the indications for decapsulation, i.e., those with anuria. In such cases the operation is efficacious. Its efficacy is demonstrated by the re-establishment of the urinary function; its harmlessness by its simplicity which makes it possible to perform it under a short ether anæsthesia in less than twenty minutes.

Limited to its precise indications, kidney decapsulation deserves the constant collaboration of the surgeon and obstetrician. W. A. BRENNAN.

### MISCELLANEOUS

**Seham, M.: The Acidotic State of Normal New-Borns, with Special Reference to the Alveolar Carbon Dioxide Tension, Alkali Tolerance, and Acetoneuria.** *Am. J. Dis. Child.*, 1919, xviii, 42.

Alveolar carbon dioxide tension is a practical index of acidosis. The modification of the Plesch-Higgins method of collecting air for determining the CO<sub>2</sub> tension with the use of the pulmotor mask is the best in the cases of new-born infants. The amount of air in the bag at the beginning of their test should not exceed 50 cubic centimeters and the breathing time should be limited to thirty seconds if the most uniform results are to be obtained.

Such determinations for a large number of new-born infants did not confirm the finding of a lower CO<sub>2</sub> tension which is indicative of the state of acidosis. The ingestion of food, starvation, and muscular exercise under experimental conditions have no constant demonstrable effect on the alveolar CO<sub>2</sub> tension. The urine of normal new-born infants is nearly always acid and an average of 1.7 grams of sodium bicarbonate is required to make the reaction alkaline, 0.16 gram being given by mouth every two hours. The alkali tolerance tests in the new-born do not indicate an acidosis. Practically no acetone is found in the urine of normal new-born infants. C. D. HAUCH.

**Warwick, M.: Cerebral Hæmorrhage of the New-Born.** *Am. J. M. Sc.*, 1919, clviii, 95.

After a review of the scanty literature on the subject the author presents the findings in cases of cerebral hæmorrhage in young infants at the University Hospital.

In 36 routine autopsies on new-born infants, 18 (50 per cent) showed a hæmorrhage in some part of the brain. Of the 18 babies, 11 were of average weight or below, and 7 above. Of the mothers, 11 were primiparæ. One was over 30 years of age, one 29, and the remaining nine, 24 years or under, suggesting that the first labor may be the etiological factor in young as well as older mothers.

Forceps were used but once and then in delivering a mother dying of pneumonia of a small six months' fœtus. Labor was markedly prolonged in only 2 cases, in both of which twins were born, the first one being normal and the second showing cerebral hæmorrhage. Only 2 of these infants were still-born. Four showed signs of asphyxia. All but 2 showed respiratory symptoms from birth.

The most important fact was that 8 (44 per cent) of the series exhibited hæmorrhages in other organs than the brain, while 5 of the 8 vomited blood before death, thus placing the syndrome known as "hæmorrhagic disease of the new-born" among the most important of etiological factors. None of the infants showed any signs of syphilis but one-fourth were premature. In the majority of the cases (72 per cent) the hæmorrhage occurred over the cerebrum where the vessels leave the longitudinal sinus and, unprotected by the dural adhesions of later life, are very susceptible to injury during molding of the head.

An attempt at a classification based on etiology is made:

1. Traumatic injury to blood-vessels during molding of the head in either normal or precipitate deliveries.
2. Congestion or stasis with rupture of veins in labors protracted or complicated by any cause.
3. Intra-uterine disease of any type in the child, and toxæmia of the mother.

In conclusion, attention is called to the fact that the condition is often a complex disease syndrome giving rise to diverse clinical symptoms and pathologic findings, and also that it may be brought about not by any single cause but by an interaction of a varying number of causes which may be found in the circumstances governing labor.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Eisendrath, D. N.: The Diagnosis of Ureteral Calculi.** *Chicago M. Rec.*, 1919, xli, 211.

Eisendrath in a well-illustrated and carefully written article enumerates the various diagnostic aids necessary for a careful, painstaking diagnosis of calculi in the ureter. Emphasis is laid on vagaries in the symptoms and the patient's history.

By the use of the shadowgraph catheter placed in the ureters and X-ray examinations after careful preparation of the patient diagnoses are most readily confirmed. Stereoscopic roentgenograms are very valuable in determining the presence of stones in the ureter.

Ureteral colic per se is not a diagnostic symptom as it occurs in many other lesions of the upper urinary tract and even in conditions not within the tract.

J. S. EISENSTAEDT.

**Sargent, J. S.: Hydronephrosis: Its Diagnosis and Treatment.** *Wisconsin M. J.*, 1919, xviii, 60.

With the exception of the rather rare syndrome known as "Dietl's crisis," the only symptom of uncomplicated hydronephrosis is a dull aching pain felt constantly or at intervals in the region of the costovertebral angle or, less frequently, under the costal margin in front. The urine presents nothing unusual as a basis for diagnosis so long as the hydronephrosis remains uninfected. Palpation of the kidney is very often unreliable when hydronephrosis is still an early condition. Because of the lack of other associated symptoms and of urinary and physical findings, it is best to suspect hydronephrosis in all cases of chronic unilateral pain, particularly in young women.

It is highly desirable that hydronephrosis be diagnosed in a relatively early stage so that, by removal of the causative obstruction, a well-functioning kidney may be spared. The diagnosis of early hydronephrosis is possible only by the most detailed methods of urological investigation. It requires catheterization of the ureters and a study of the divided urines, estimation of the function of each kidney by the phthalein test, and pyelography with a close study of the outline of the renal pelvis and its major and minor calices. The earliest pyelographic changes noted in hydronephrosis are blunting or obliteration of the minor calices, broadening of the base of the major calices, and an increase in the size of the renal pelvis.

The treatment of hydronephrosis is dictated by the degree of damage done the affected kidney. When the function of a hydronephrotic kidney is entirely destroyed it should be removed. In early

hydronephrosis, when a fair amount of function still remains, removal of the causative obstruction is the procedure of choice.

## GENITAL ORGANS

**Jones, W.: Tumors of the Bladder.** *Canadian Pract. & Rev.*, 1919, xlv, 177.

Tumors of the bladder constitute 3 per cent of urinary diseases and because such growths are usually found near the ureteral openings the author suggests that the cause may be something in the urine. He classifies these tumors as epithelial, connective-tissue, and dermoid, those of the first two classes including both benign and malignant neoplasms.

The most characteristic vesical tumor is the benign sessile papilloma, the sole indication of which is often irregular, symptomless hæmaturia. Such tumors begin singly, tend to multiply, are potentially malignant, and often recur after operation.

The papillomata which are malignant from the start are often multiple. They are sessile and have short villi, are surrounded by thickened mucous membrane, and grow rapidly.

The nodular growth, which is sessile and has a roundish base and nodular surface, is situated on the base of the trigone and has no villi.

The infiltrating growths, which are malignant, oval, and about 1 inch in diameter, are generally found near a ureteral opening.

The symptoms of malignant bladder tumors are increasing hæmaturia, spontaneous cystitis, pain, and emaciation.

To diagnose the presence of vesical tumors the cystoscope should be used at once and followed by the X-ray with thorium and examination by rectum or vagina.

The author recommends fulguration for benign villous tumors and recurrences, but the open operation for malignant and extensive growths.

B. F. ROLLER.

**Rathbun, N. P.: Notes on Vesical Diverticula.** *Surg., Gynec. & Obst.*, 1919, xxix, 28.

Rathbun reviews the development of the diagnosis of vesical diverticula and the relation of the cystoscope to it.

In discussing the congenital and acquired forms of such diverticula, the author states that a condition which appears to be another form of diverticula is frequently seen in bladders which are hypertrophied as a result of some obstructive lesion in the prostate or urethra. These, however, are not true diverticula and their consideration and treatment is



that of the underlying condition. In the author's opinion all true diverticula are congenital.

In the discussion of the symptomatology of vesical diverticula it is stated that in the absence of cystitis with very foul urine, the symptoms, if any, are very mild in character. Most patients when first seen, however, have a very severe and chronic cystitis. Frequently they state that almost immediately after apparently emptying the bladder completely they are able to pass another considerable quantity of urine after a change of position. The diagnosis can therefore be made definitely without the routine use of the cystoscope and the study of the bladder with the X-ray. Cystograms are believed by the author to be best obtained by the use of a 25 per cent solution of sodium bromide.

The article contains a review of the methods of attacking vesical diverticula surgically and the history of one of the author's cases. The conclusions drawn are as follows:

1. Simple excision of the mucous membrane is hardly enough and unless the whole diverticulum is removed with all its coats a recurrence of the trouble is invited.

2. Severe cases should be treated in two stages, the first consisting of somewhat prolonged drainage of the bladder itself and also of the diverticulum, which latter is effected by stretching the orifice, and the second consisting of the radical excision of the diverticulum.

3. In difficult cases the dissection is facilitated by combined extra- and intravesical manipulation, the entire sac being invaginated with all its walls and the operation completed within the bladder.

A. C. STOKES.

**Martin, A. P.: The Treatment of Chronic Seminal Vesiculitis** (Tratamiento de las vesiculitis seminales crónicas). *Siglo méd.*, 1919, lxvi, 356.

Martin points out that lesions of the seminal vesicles are frequently responsible for the persistence of gonorrhoeal processes. As the symptoms of the vesiculitis are often masked, the prostate is blamed and often wrongfully operated upon. In painfully chronic cases with recurring epididymitis the seminal vesicles will usually be found to be diseased.

The author reports 7 cases, most of which were cases of gonorrhoeal inflammation of the seminal vesicles, which he treated according to the method devised by Thomas of Philadelphia. This treatment is based on the following facts:

1. When a fluid is injected into the deferent canal in the direction of the outlet of the seminal vesicles into the posterior urethra, the injected fluid will seek the vesicle, provided the latter is empty, rather than the exterior, since this outlet of the vesicle is of greater caliber than the opening of the ejaculatory duct in the urethra.

2. When the quantity of fluid injected is not large enough to excite contracture of the vesical musculature to expel it, the injected fluid will remain

and exert its germicidal action in the vesicle for a long time, especially if the latter has been previously emptied by massage.

The therapeutic effect of this method is therefore greater than that of a simple vesiculotomy and operative traumatism is avoided. Whatever theoretical objection may be offered to the method the practical results obtained from it are excellent. The only operation necessary is a small incision to reach the vas deferens from whence the injection is made. Collargol or some other silver salt is then injected and the skin incision sutured.

Neither epididymitis nor funiculitis was observed in any of the 7 cases treated and the results were quite satisfactory.

W. A. BRENNAN.

**Hartmann, H., and Peyron, A.: Placentomata and Choriomata of the Testicle** (Placentomes et choriomes du testicule). *Bull. Acad. de méd., Par.*, 1919, lxxxi, 733.

Complex testicular tumors containing recognizable foetal parts are described in classical works. The authors take up the study of placentomata and choriomata which, although reported by several, are still little known. They have studied 50 cases, in 27 of which an exact microscopic examination was possible.

Previously it was believed that placentomata were more frequent than choriomata, but this does not seem correct. Of the 27 tumors 14 were choriomata and 13 placentomata. The distinction between these two types of tumor, however, is not always definite. Normal embryology shows a series of transitions between the non-differentiated chorio-ectoderm and the developed placental tissue. The examination of some of the tumors in the same way shows the co-existence of two cellular types which correspond merely to different stages of evolution.

The authors have personally seen and operated upon 1 case of chorioma of the testicle, and report 2 cases of placentomata in addition to the 40 cases reported in literature. The pathology of these tumors is described and the various theories as to their specific nature are discussed.

Up to the present time testicular choriomata have not been individualized. Only the placentomata have been studied. Pick seems to have been the only author to discuss chorionic proliferation. The frequency of choriomata in proportion to other testicular tumors appears to the author destined to increase the number of specific cases reported as hitherto they have been described under a variety of names, such as "cystic tumor," "wolffian tumor," etc.

The author concludes from his study that in the testicle (which like the ovary is a selective site for embryomata) a series of tumors of complex growth may be observed which correspond to the successive developmental stages of the ovum, the embryo, properly so-called, and the foetus. In these various tumors the proliferation of the trophoblast, a formation normally charged with the function of providing a bond between the mother and foetus may be such



that it constitutes a placentoma identical with the uterine placentoma, or may constitute a chorioma characterized by special embryonic elements.

W. A. BRENNAN.

**Canovas, B. N.: Roentgen [Therapy of Prostatic Hypertrophy** (La roentgenterapia en la hipertrofia de la prostata). *Siglo méd.*, 1919, lxvi, 433.

In roentgen therapy we have a new means of combating prostatic hypertrophy. When the condition is of the glandular type it is particularly amenable, and the more the glandular tissue predominates over the connective tissue the better the results obtained.

Of 10 patients treated by roentgen therapy 4 had previously been subject to frequent attacks of urinary retention. These attacks had not returned more than a year later. Under the influence of strong doses of hard roentgen rays a notable reduction of the volume of an adenomatous prostate has been effected in most cases within six months. The symptom which yields best to the treatment is pollakiuria.

In Canovas' opinion every case of prostatic hypertrophy should be given a tentative course of raying before resort is had to operation.

No details are given regarding the technique.

W. A. BRENNAN.

**Spittel, R. L.: Calculi of the Prostate.** *Indian M. Gaz.*, 1919, ii, 255.

Prostatic calculi usually occur in middle and old age. Two of the author's cases, however, were those of men of 19 and 20 years, respectively, and one that of a man of 35 years.

Calculi in the prostate may have three modes of origin and formation as follows:

1. They may be formed in the substance of the prostate itself, having as a base corpora amylacea with varying amounts of calcium phosphate and carbonate. Stones so formed vary in size, some being as small as a grain of sand and others large.

2. They may be formed in pouches (congenital or acquired) that communicate with the prostatic urethra.

3. They may have their origin in the kidney or bladder and become lodged in the prostatic urethra secondarily.

In the first case reported by the author, the 2 stones which were found he believes were formed first in the prostatic urethra. Although most often the perineal route is best for the removal of prostatic stones, the writer in this instance did a suprapubic operation.

In the second case there were 12 faceted stones. These were removed through a suprapubic incision. Later, perineal drainage was necessary. In this case the perineal operation would have been better. The stones were found in pouches communicating with the prostatic urethra.

In the third case a large number of very small stones due to corpora amylacea were found. As

this patient had stricture and chronic infection which had existed for years, the writer concluded that the symptoms were due to these causes rather than to the stones.

A detailed description of the symptoms, physical findings, operation performed, progress of the condition and composition of the calculi, and comments are given for each case. The article includes also drawings of some of the stones. G. J. THOMAS.

**Hubney, M.: Prostatic Calculi from the Roentgen-Ray Diagnostic Standpoint.** *Am. J. Roentgenol.*, 1919, vi, 286.

The author reviews the literature on prostatic calculi very thoroughly and calls attention to the fact that these stones should be carefully differentiated from bladder or deep urethral stones. He agrees with Kretschmer that in all cases in which a stone has been removed by prostatic massage another X-ray examination should be made afterward to determine whether all the stones have been removed.

Points established by the literature were:

1. That prostatic calculi occur much more commonly than is thought.

2. The condition is often confused with chronic prostatitis.

3. That a stone in the prostate can be diagnosed definitely by the roentgen ray.

4. That the demonstration of stones by the roentgen ray will often obviate the operative opening of the abdomen and bladder as in many cases the calculi may be expressed through the urethra.

W. A. EVANS.

## MISCELLANEOUS

**Paul, H. E.: Notes on Diagnosis in Affections of the Urinary Tract.** *Canadian M. Ass. J.*, 1919, ix, 614.

In the first part of this paper the author emphasizes the necessity for early diagnosis, the responsibility assumed by the general practitioner, and the need of a systematic routine in diagnosis. He then discusses the diagnosis as related to pain, disturbances of urination, urinary findings, obscure infections and tuberculosis of the urinary tract.

Pain is an uncertain factor as it may be reflected into the rectum from a diseased urethra, to the glans penis from the prostate, to the cord or testes from the ureters, and into the lower back, rectum, or testes from the seminal vesicles. Capsular tension in renal lesions may cause pain in the loin. Again, pain may be entirely absent.

Disturbances of urination should be thoroughly investigated with the cystoscope, ureteral catheter, endoscope, and X-ray. Kidney function tests and careful urinalysis are of extreme importance. Pus, blood, and bacteria should always be traced to their sources.

"Urethral chill" or "catheter fever" is an acute exacerbation of a chronically infected kidney and



is therefore a form of urinary septicæmia. The absorption of bacteria apparently takes place through an abraded or contused prostate. An acute exacerbation of a chronic colon-bacillus infection of the urethra is termed by the laity "cold in the bladder." The seminal vesicles and prostate are frequently the sites of mild persistent septicæmia and are very often neglected in the search for the cause.

In tuberculosis of the kidney, symptoms are not observed until the lesions are connected with the urinary tract. This may take months or even years. Gradual increase of bladder irritability, with increasing frequency of urination and pain, are the most common early symptoms. Hæmaturia may also be an early symptom. Cystoscopy, with an exhaustive study of the urine and functional tests of the individual kidneys and the demonstration of the tubercle bacilli in the urine, by the microscope, cultural methods, or guinea-pig inoculation, determine the diagnosis. C. D. PICKRELL.

**Covisa, I. S.: Statistics upon Urinary Lithiasis and Its Geographical Distribution in Spain** (Reflexiones estadísticas sobre la lithiasis urinaria y su distribución geográfica en España). *Rev. españ. de cirug.*, 1919, i, 227.

Urinary lithiasis is very common in Spain. As in other countries it occurs more frequently in men than in women, the ratio being 7:4.

In a total of 346 cases collected from various Spanish statistics approximately 50 per cent of the

cases were those of children, the majority children under 5 years of age. Vesical lithiasis is very rare or is rarely observed in children under 2 years of age.

The present treatment of the disease is confined to hypogastric section and lithotripsy or litholapaxy. Perineal section is not employed, or only very rarely.

The author operated upon 71 patients, performing 73 operations. Of the latter, 54 were suprapubic sections (30 in children, 26 in adults); 14 lithotrities (1 in a child and 13 in adults); and 2 perineal lithotrities. None of the lithotrities was followed by death. The mortality following the suprapubic sections was 3.5 per cent. The two deaths, however, were those of a child of 2 years and a man of 73 and were not directly due to the operations.

The predominance of sections over lithotrities is explained by the fact that a large number of the patients operated upon were children. For children the operation should consist of a small suprapubic incision, section of the bladder, removal of the stone, closure with antero-vesical drainage, and the introduction of a retention catheter. In the majority of cases healing will occur by first intention within eight to ten days.

The author's statistics include 19 cases of renal lithiasis in 14 of which an operation was performed. The operations executed were: Five pyelotomies, 6 nephrectomies, 2 nephrolithotomies, and 1 nephrostomy. There were no deaths, a fact which demonstrates the slight gravity of surgical intervention in renal lithiasis.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Briggs, H. H.:** Hereditary Congenital Ptosis, with Report of 64 Cases Conforming to the Mendelian Rule of Dominance. *Am. J. Ophth.*, 1919, ii, 408.

Briggs reports a genealogy of West Tennessee mountaineers, comprising six generations, covering a period of one and one-quarter centuries, and including 128 members, one half of whom were affected with ptosis, and the other half normal. Twenty-three families are represented, in 17 of which the malformation was transmitted by the father, and in 6 by the mother. There was only one case of intermarriage. Of the 64 persons affected with ptosis 33 were males and 30 females. The sex of the one remaining is unknown. Forty-one males and 23 females were normal. The author reports in detail the cases of 6 persons representing the fourth, fifth, and sixth generations. While there is some variation among the different individuals as to the degree of ptosis, there has been no diminution of the ptosis from one generation to the next.

It is shown that the transmission of this defect through the six generations studied conforms to the Mendelian criteria of a dominant character, i. e., (1) the transmission is through affected individuals only; (2) in every case one parent of the dominants is affected and the other is normal; (3) the ratio of 64 dominants (ptosis) to 64 recessives (normals) conforms to the third qualification of dominants, which requires an expectancy of an approximately equal number of normal and affected offspring; (4) in no case was an affected child born of normal parents, which shows that the character in question is not recessive.

The author reviews the literature, referring to more than 100 cases of ptosis, reported by 22 authors, in which the condition was associated for the most part with other abnormalities of the ocular muscles and other hereditary ocular defects.

The etiology of hereditary congenital ptosis is practically undetermined. The pathology of the condition as reported by various authors includes absence of the levator, defective development of the levator and other ocular muscles, connective-tissue bands instead of muscles, adhesion of muscles, and abnormal insertion of muscles.

The author discusses the diagnosis, especially between congenital and acquired ptosis, and refers to the conditions associated with each. Hereditary ptosis is always congenital and is often associated with absence or deficiency of the superior rectus and epicanthus. There may be absence or deficiency of the portion of the third nerve supplying the levator. Acquired ptosis is due to a variety of local,

central, and general conditions. The unique feature of the author's series of cases is that the ptosis is uncomplicated by any other defect in motility.

W. F. MONCREIFF.

**Wood, D.:** Focal Infection in Relation to the Eye and Ear. *J. Lancet*, 1919, xxxix, 365.

The paper is summarized as follows:

1. Focal infections are very common causes of eye disease and the structures affected are most frequently those of the uveal tract.

2. As a rule the focus of infection is chronic, and on account of the low virulence of the infecting organism is often in a quiescent state insofar as subjective symptoms are concerned.

3. More than one focus may have an etiological bearing on a given condition at the same time.

4. The most common locations of the disturbing foci are in the head—the nose and accessory air spaces, mouth, teeth, throat, middle ear and mastoid—though they may be found elsewhere, particularly in connection with the mucous membranes.

5. The most common types of infecting organisms are the streptococcus-pneumococcus group, the tubercle bacillus, and the gonococcus.

6. Inability to find a focus does not prove its non-existence.

S. S. HOWE.

**Castresana, B.:** New Surgical Treatment of Strabismus (Nuevo tratamiento quirúrgico del estrabismo). *Siglo méd.*, 1919, lvi, 413.

All distinct surgical methods for the correction of strabismus may be divided into two principal groups: (1) those intended to decrease the traction exerted by the internal or external rectus muscles; and (2) those intended to increase this traction.

Castresana finds various defects in these methods which he discusses at length, quoting extensively from literature. His own method is based on indirect bilateral advancement with weakening of the antagonistic muscle. In the case of a convergent strabismus the internal recti muscles are weakened and in the case of a divergent strabismus the external are advanced. A portion of the muscle is resected and three sutures passed under the stumps through the sclera and conjunctiva at each side. The central suture is horizontal while the two others curve outward. As the threads are drawn the indirect advancement of the muscle corrects the deviation of the eye and the strong adhesions which are set up make the correction permanent.

In 80 cases in which the author has operated the results have been very gratifying. About 2.5 millimeters of muscle were resected for every 10 degrees of deviation.

W. A. BRENNAN.



**Veasey, C. A.: Report of Two Cases of Melanotic Sarcoma of the Choroid.** *Northwest Med.*, 1919, xviii, 137.

In the author's first case the vision of the right eye had been lost for at least one year prior to the first consultation which was occasioned by an attack of acute secondary glaucoma. The retina was detached. There was no interference with transillumination because the tumor was situated very near the posterior pole of the eye. Marked symptoms of irritation in the left eye disappeared promptly after enucleation of the right eye. On sectioning, the tumor was found to be a fungoid mass, 16 millimeters in diameter, arising from the pigmented connective tissue of the vascular layer of the choroid.

The second patient was also seen during an acute attack of glaucoma involving the left eye which had been blind for several months. On transillumination a dark area was seen. Enucleation was followed by uneventful recovery. In this instance the tumor was larger and projected well into the eye.

Neither of these patients has had a recurrence.

W. F. MONCREIFF.

**Kearney, J. A.: The Importance of the Early Detection of Glaucoma and Its Management.** *N. York M. J.*, 1919, cx, 11.

Kearney emphasizes the importance of the early diagnosis and treatment of glaucoma and the purpose of his article is essentially to direct the attention of the general practitioner to the means of recognizing the disease early while there is still some possibility of saving useful vision.

He reviews the features of the clinical picture and findings to be looked for, especially in the prodromal period and early stages of the process. Methods of management are discussed with particular reference to the value of sclerotomy.

In performing an iridectomy for glaucoma the author prefers to use a keratome with bread-knife edges such as that devised by Cavanagh of New York. The author's results from the trephine operation of Elliot and its modifications have not been more satisfactory than those obtained by a combination of some of the other measures in general use.

W. F. MONCREIFF.

**Butler, T. H.: Some Statistics of Cataract Extraction.** *Brit. J. Ophthalm.*, 1919, iii, 317.

Butler divides the complications of the extraction of senile cataract into three classes: those which occur at the operation itself; those that supervene during the healing process; and those which may arise at any period, even years, after a successful operation. In the few cases in which the eye is lost, it is nearly always the fault of the patient; the author's losses of this type have amounted to 1.5 per cent of the total number of operations.

The complications of healing account for the majority of the bad results and are principally due to the action of endogenous or exogenous toxins.

Butler gives the statistics of four series of extractions. The first series included 64 cases operated upon at Jerusalem during a period of four years. In this group there were 52 normal extractions (80.3 per cent) and 4 cases of loss of the eye (6.5 per cent) due in 1 case to panophthalmitis, in another to sympathetic cyclitis, and in 2 to loss of vitreous. Vitreous escaped in 11 cases (17.2 per cent) due to the lack of self control of the Jewish patients. The most remarkable feature was the entire absence of iridocyclitis in spite of the almost universal prevalence of trachoma and other conjunctival infections, and the fact that no cultures were taken and the lachrymal sacs were not syringed out before operation.

The second series comprised 200 operations upon non-diabetic patients in England during a period of eleven years. Extraction after preliminary iridectomy was done in 177 cases, combined extraction in 22 cases, and single extraction in 1 case. Four of these were intracapsular extractions. Six lenses were removed with the vectis. Late closure of the wound occurred twice. Vitreous escaped in 11 cases (5.5 per cent). Prolapsed iris occurred in 8 cases (4 per cent) and slight iridocleisis, short of prolapse, in 10 cases (5 per cent). There was a cystoid scar in 3 instances. Iridocyclitis occurred in 21 cases (10.5 per cent) and in 9 of these (4.5 per cent) the eye was lost. Needling was done in 44 cases (22 per cent). In the entire series 14 eyes were lost (7 per cent). In 117 cases (58.5 per cent) the vision was  $\frac{6}{12}$  or better.

In the third series, 10 extractions in diabetics, 4 eyes were lost by iridocyclitis which in 3 cases directly followed the preliminary iridectomy.

The fourth series comprised 50 operations done in Britain during 1918. Cultures from the eyes were sterile or at most contained only the staphylococcus albus or citreus before operation was done. There were only 2 cases of iridocyclitis, and no eye was lost from this cause. Two eyes were lost from panophthalmitis and sympathetic ophthalmitis, respectively. In 44 cases the vision was  $\frac{6}{60}$  or better.

The author concludes that iridocyclitis is not always the effect of an infection from without, for the following reasons:

1. An exactly similar iridocyclitis follows blows upon the eyes of aged and decrepit persons.
2. The complication is entirely absent in Palestine in spite of the prevalence of trachoma and chronic conjunctivitis.
3. If one eye has been affected with postoperative iritis, the other eye is apt to suffer in the same way.
4. Increased stringency in asepsis, the use of cultures, masks, etc., does not seem to have sufficient influence in reducing the percentage.
5. The fact that diabetics, who are susceptible to iritis, are far more apt to suffer from the disease than normal persons.

The author emphasizes the value of a general study of the patient before operation, especially



with regard to oral sepsis and other endogenous foci. Valuable information as to the amount of resection to be expected is often gained by a preliminary iridectomy. The lachrymal sacs are syringed out prior to operation as a routine procedure, and if pus is present, are excised. The author has found that extraction of the lens when the pupil is fully dilated favors iris incarceration. W. F. MONCREIFF.

### EAR

**Abadal, L. V.: The Treatment of Mastoiditis in Infancy** (Mastoiditis en la infancia; su tratamiento) *Rev. españ. de cirug.*, 1919, i, 304.

The infections of the mastoid in infants are of acute or chronic tuberculous type with an exudative diathesis. In a great many cases, and especially in infants only a few months old, acute mastoiditis may be effectively treated by making a simple Wilde incision a few centimeters long and then curetting the fungosities, or by the classical incision of Wilde. Often the abscess is merely subperiosteal. In some cases the antrum may be opened with the bistoury. By incising the external cortex drainage is greatly facilitated and the time of treatment is shortened.

When other mastoid cells are invaded, however, or when a focus of osteitis has formed in the antrum or mastoid, total decortication is necessary to prevent constant recurrences.

The author follows the method recommended by Clané and Falgar even if the lesion is limited to the base of the mastoid. This consists of curetting all the cells and then swabbing out the opening. Patients operated upon in this way recover rapidly. The main object in the method is to obtain asepsis since infection is what makes the treatment of this condition interminable.

Abadal does not use antiseptic solutions, not even Dakin's fluid. Hydrogen peroxide he regards as especially bad since it favors the fungoid growths. If the wound is not badly infected the treatment should be dry, applications of tincture of iodine and lavage of weak solutions of zinc chloride being added intermittently and the wound plugged with loosely packed gauze.

The majority of the hospital patients treated have subacute mastoiditis with a tuberculous basis, or chronic tuberculous mastoiditis. Owing to the delicacy of the mucosa of the cavity in infants, only a mastoidectomy is done. This is followed by care-

ful curetting of all suspicious points. Good results have been obtained in many cases. However, when there is a focus of infection in the aditus and especially if it communicates with the cavity, there is no other remedy except the radical operation. Without such an operation the patient is either not cured and there is a reappearance of the fungi and purulent discharge, or if a cure results it is obtained only after long persistence of the symptoms and an interminable number of treatments. The author concludes:

1. In nurslings with acute mastoiditis an ample Wilde incision and curetting of the fungosities obviates a mastoid trephining.

2. In older infants with acute or subacute mastoiditis total decortication of the mastoid is almost always necessary and sufficient.

3. If a focus of osteitis exists in the aditus, especially the anterior half, decortication and careful curetting may suffice but generally the radical mastoid operation is required.

4. When the origin of the mastoiditis is tuberculous or due to cholesteatoma, the antrum must be opened.

W. A. BRENNAN.

**Botella, E.: The End-Results of Petromastoid Evacuations** (Resultados lejanos de los vaciados petromastoideas). *Rev. españ. de cirug.*, 1919, i, 302.

The author's conclusions are:

1. In petromastoid evacuations the operative cavity becomes covered by epidermis.

2. In a large number of cases the natural renewal of the epidermal cells results in an accumulation of these cells in the operative cavity, and owing to the fermentation of fatty acids a steatomatous mass is formed with the possible consequences of bone infection, abscesses, etc.

3. In order to avoid such complications continuous vigilance and periodical cleansing are necessary. The cleansing should be done every fifteen or twenty days in the following way: lavage of hydrogen peroxide should be given for two days to loosen and dislodge the old cells, after which the surface should be wiped with a cotton applicator. Finally, the cavity should be swabbed with another applicator dipped in 90 per cent alcohol.

4. Patients and their families should be informed regarding the danger of neglecting or omitting this postoperative cleansing of the cavity.

W. A. BRENNAN.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Barajas, J. M., and De Vilches:** *Albuminuria Following Operations upon the Nasal Fossæ and Its Clinical Interpretation* (Albuminurias consecutivas a las intervenciones en las fosas nasales y su interpretación clínica). *Med. Ibera*, 1919, vii, 141.

Albuminuria is very frequently observed following operations on the nasal fossæ. It is observed exclusively, however, when the operation is done on the external part of the fossa and is never seen after an operation on the internal part.

In the case of a patient who has undergone any surgical treatment involving the nasal fossæ, even a cauterization, the urine should be systematically examined for the presence of albumin during the twenty-four hours following the operation.

The observations made by the authors in a number of cases lead them to conclude that the prognosis is favorable in spite of the fact that the albuminuria may be associated with alarming general symptoms.

The pathogenesis of this albuminuria may be traced to a reflex action which, starting in the hypophysis, terminates in the kidney through different nerve centers, principally the medulla oblongata in association with the vascular system.

The fact that this syndrome is observed not only in cases of cauterization, but also following turbinectomies suggests that the theory ascribing the stimulus which acts upon the nerve centers to a chemical substance elaborated in the site of cauterization is incorrect. W. A. BRENNAN.

## THROAT

**Robb, J. M.:** *Tonsillectomy Technique*. *J. Michigan State M. Soc.*, 1919, xviii, 333.

After grasping the tonsil firmly, the margin of the anterior pillar should be entered close to the edge and always at the insertion of the palatoglossus muscle with the tongue. A sharp dissector should be used and then turned sidewise to cut upward. An assistant should follow with a crooked dull dissector, keeping the pillar on the stretch. Both pillars should be kept tense by pulling upward with the dull dissector while the sharp dissector frees the posterior pillar. The work of separating the tonsil from its bed may be done with the sharp or dull dissector or both, followed by the snare. O. M. ROTT.

**Ruedi, T.:** *Observations on the Operative Treatment of Tuberculosis of the Larynx*. *Brit. M. J.*, 1919, i, 764.

During a period of six years at Davos the author has seen 575 cases of laryngeal tuberculosis. In these

575 cases 1,548 operations were performed. In 61 cases curetting alone was done, in 168 both curetting and cauterization, and in the remaining 1,319 the electrocautery alone was employed. As regards the location of the disease, the author's cases did not show any homolaterality of pulmonary and laryngeal tuberculosis.

There were 259 cases of the first stage of the disease, 265 of the second stage, and 59 of the third stage. Patients were subjected to operation only after their general condition had been improved as much as possible by fresh-air treatment. An operation for tuberculous laryngitis should be undertaken only when the pulmonary tuberculosis is stationary and the patient's general condition is good.

The method which gave the best results was electrocauterization, for which a sharp-pointed cautery was used with its full destructive action. No serious oedema followed this thorough cauterization, and tracheotomy for stenosis following operation was never necessary. Hæmorrhages occurred twice.

The results show that in the cases of the first stage of the disease the author obtained a cure in 49.4 per cent, i.e., no evidence of the disease was present three months after the last treatment. In cases of the second stage, cure was obtained in 25 per cent, and in those of the third stage, in 13.3 per cent.

D. C. BALFOUR.

## MOUTH

**Pringle, J. H.:** *Displacement of the Mandibular Meniscus and Its Treatment*. *Brit. J. Surg.*, 1919, vi, 385.

As in the knee-joint, so in the mandibular articulation, displacement of the meniscus is the result of some sudden movement.

Contrary to the usual description of the mandibular meniscus, the author has invariably found that there is a very decided central thickening of the disc in its coronal plane over the summit of the condyle. In front of this ridge there is a distinct depression in the disc which fits the tuberculum articulare of the temporal bone, while below and anterior to it there is a second thickening which forms the anterior border of the disc and in its lower part the insertion of the external pterygoid muscle. The author believes it is due to overaction or irregular action on the part of the external pterygoid muscle that the disc gets dragged out of its normal position.

After displacement the disc acts as a foreign body in the joint; either it gets caught between the rolling condyle and the tuberculum articulare or continues to move with the condyle but in flexion cannot clear the articular eminence.



Pain, difficult mastication, and a definite feeling of obstruction in the joint preventing complete flexion are the main symptoms.

Reduction may be accomplished by keeping up hard pressure at the back of the condyle with the mouth open and slowly closing the jaw. In some cases this process must be repeated several times. The moment it succeeds, the sensation of the presence of a foreign body in the joint disappears at once. In recurring cases the only method of treatment is operation.

In 1887 Annandale recorded two operative cases in which he sutured the loose disc to the periosteum. In 1911, the author removed the left disc in a young woman suffering from frequent recurrence and obtained a very good result. E. A. PRINTY.

**Levy, J.:** Root Amputations. *Dental Cosmos*, 1919, lxi, 649.

The majority of dentists consider apicoectomy advisable in cases of chronic apical infections in which the bone, peridental membranes, and not more than the apical third of the root are involved.

The roots of the 6 upper front teeth are amputated most easily, while in the case of the 10 lower front teeth, the upper bicuspid, and the molars, this operation is difficult.

Guttapercha is regarded as the best material for filling the root canals. The use of chloroform and resin, chlorapercha, or sucapercha with the gutta-percha seems to be a matter of choice.

When the operation is followed by check radiograms the percentage of successes is moderately high.

Failures are reported as due to faulty technique, low vitality of the surrounding tissue, and re-infection.

For removing the apex of the tooth, the burr is given the preference over the chisel.

Six months is the average time required for complete regeneration of the bone in successful cases but varies with the patient's age and vitality.

Suturing the incision is recognized as being the preferable method of closing the wound as it tends to hasten the healing, prevent re-infection, and les-

sen the after-pain. In cases of extensive involvement, packing is advocated.

Opinion is divided as to whether apicoectomy should be performed by the specialist or the general practitioner. It is generally conceded, however, that unless the general practitioner is well equipped, has a thorough knowledge of asepsis, and has developed a skillful technique, the operation should be performed only by the specialist.

M. N. FEDERSPIEL.

**Dewey, K. W.:** The Lipoids in Tumors of the Dental Region. *J. Cancer Research*, 1919, iv, 263.

The selective staining methods of Ciacco, Smith, and Fischler used with the general lipid stains, Sudan III and Nile blue, and reinforced by the aid of the polarizing microscope, are fairly adequate means for a histomorphological differentiation of the various lipoids present in tissues.

The lipoids in pathologic dental tissue are chiefly cholesterol which occurs at times as the stable ester compound, but much more frequently in more or less loose combination with fatty acids and other lipoids. The fatty acids and soaps which are found in certain tumors are located chiefly in the zone of squamous epithelial cells. Otherwise they occur in the degenerated walls of blood-vessels in tissue with a depleted blood supply.

The mixtures of cholesterol and fatty acids occur in the form of droplets and granules within cells, chiefly endothelial cells and leucocytes. They have anisotropic properties. There are mixtures of cholesterol with glycerin esters and probably other lipoids in degenerated connective tissue which have not the form of droplets and granules and are not doubly refractive. The lipoids in pigments seem to be chiefly mixtures of cholesterol with glycerin esters. Double refraction is not observed in pigments.

Fatty acids and soaps are found in areas where hyaline degeneration and calcification also are observed. The question of whether, or how, these substances may be involved in the process of calcium decomposition was not approached in the principal part of the study.

M. N. FEDERSPIEL.



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# INTERNATIONAL ABSTRACT OF SURGERY

DECEMBER, 1919

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Pool, E. H.:** *War Wounds: Primary and Secondary Suture.* *J. A. M. Ass.*, 1919, lxxiii, 383.

There are three varieties of suture of war wounds, primary suture, delayed primary suture, and secondary suture.

The advantages of primary suture are obvious. The disadvantages consist in closing noxious micro-organisms, particularly of the type which produce gas gangrene, within an imperfectly debrided wound. An occasional severe gas-bacillus or pyogenic infection will counterbalance many successful closures. Primary suture is indicated if early and thorough débridement can be done and the case can be watched carefully for some days. During active periods when the number of wounded is large and they must be evacuated early, primary suture should not be considered.

Wounds involving the muscles of the calf, thigh, or gluteal regions should not be closed as a rule after a longer interval than eight hours. Wounds of the face and scalp are regularly sutured. Generally wounds of the hands should be sutured. Extensive wounds of the feet should be left open.

Partial primary suture of wounds of the soft parts has nothing to recommend it; it is often harmful and therefore should seldom be employed.

A wound closed by primary suture should be examined within twenty-four hours and the general condition of the patient carefully watched. These precautions cannot be too strongly urged. Local tenderness or spontaneous pain with swelling in a wound twelve hours after primary suture is suggestive of gas-bacillus infection. Suggestive general symptoms are rapid pulse, a moderate rise in temperature, and a peculiar gray appearance of the face. These rapidly become worse if the condition is not relieved. It is the failure to recognize the development of gas-bacillus or pyogenic infection sufficiently early, the unwillingness to admit failure of the primary suture and to re-open the wound

completely and excise freely the gangrenous muscle that causes the fatalities.

The technique of primary suture is described briefly as follows: thorough débridement; complete hæmostasis and sufficient washing of the wound to remove blood clots and loose fragments of tissue; muscles and aponeurosis are approximated with interrupted catgut and the skin and subcutaneous tissues are closed with interrupted silkworm gut. A drain is rarely needed but should be employed for twenty-four hours if there is likelihood of oozing. After dressings are applied the parts should be immobilized.

Delayed primary suture is a suture which may be used when the edges of the wound can be approximated and will unite without excision of tissue. Secondary suture may be used when the epidermis has grown inward and must be excised for proper union. In determining whether a wound may be sutured or not reliance must be placed chiefly on cultures showing the presence or absence of hæmolytic cocci. For this, a routine blood-agar examination is essential. Delayed primary suture is usually done within six days after the primary operation. Its advantages are the practical elimination of the danger of gas-bacillus infection and a marked lessening of the danger of pyogenic infection.

When a delayed primary suture is to be used all dressings after the primary operation are made according to the Carrel-Dakin technique. As pre-operative preparation, the skin is painted with tincture of iodine after thorough cleansing as in routine dressing. The details of the suturing are the same as for primary suture.

When the daily wound smear shows approximately one organism to two fields on two successive days and two successive cultures show an absence of hæmolytic cocci, the wound is suitable for secondary suture and is prepared exactly as for delayed primary suture. The new epidermis along the skin edge is then excised. The skin is freed by undermining in all directions as far as necessary in order



to approximate the edges with the minimum tension. Dense scar tissue and projections of granulation tissue are removed. When possible, the deep fascia is approximated with interrupted catgut. Skin and subcutaneous tissue are closed with silkworm gut.

In most cases of compound fractures of the long bones delayed primary suture should be aimed at when the patient can be properly operated upon and watched thereafter. Primary suture may be performed safely in some cases but is dangerous.

In cases of joint wounds treatment should consist in complete débridement of the tract, removal of foreign bodies, irrigation with saline, distention with ether, absolute closure of the joint by suture, with or without primary suture of the soft parts according to rules laid down for primary suture, and finally, early active motion.

If following the operation the joint becomes distended, it should be aspirated immediately. If a culture demonstrates pyogenic infection, lateral incisions should be made at once, or if the original incision allows satisfactory drainage, it should be re-opened and the treatment for suppurative arthritis begun.

H. C. FALK.

**Grégoire, R. F.: The Immediate Closure of War Wounds.** *Med. Rec.*, 1919, xcvi, 195.

Grégoire reviews the indications and technique of immediate suture of war wounds and maintains that the remarkable and unexpected results obtained by war surgery in all branches had their origin in the early attempts at primary closure of wounds.

The advantages of immediate suture were the prevention of gas gangrene, the abolition of suppuration with its attendant innumerable dressings and painful and long-continued after-treatment, and the gain in the number of returnable effectives to the fighting line.

The method is based upon certain principles of pathologic physiology; it is not to be applied indiscriminately but should be governed by precise therapeutic indications.

The wound is first inoculated by the foreign body but not at first infected. In the first few days following the receipt of the injury there is a sort of stupor of the region involved. The wounded tissues do not react; there is no sign of diapedesis; the micro-organisms are not proliferating. This period of stupor lasts for seven or eight hours after the infection of the wound. At the end of that time the white blood cells begin to invade the wounded region and the system of defense is organized. Simultaneously, however, the micro-organisms begin to develop, the anaerobes being the first to proliferate. From the fortieth hour on, both anaerobes and aerobes abound.

Therefore, between the moment when the wound is inoculated and that in which it is infected there is a period of stasis or stupor lasting from eight to twelve hours which the surgeon may utilize to remove both the disorganized tissues and the infecting agents.

Suppuration is a formal contra-indication to

suture. When the wound is already bathed in pus it is too late to close it, even after resection of the infected tissues. It must then be sterilized by chemical methods similar to the Carrel method.

Foreign bodies, projectile fragments, clothing, infected skin, soil, and contused and devitalized muscle must be removed until bleeding contractile muscle is exposed. Above all, hæmostasis must be complete before primary suture is attempted.

Wounds of bones and joints require a more vigorous technique and greater skill on the part of the surgeon, but the percentage of functioning and useful joints far exceeds that formerly obtained in civil practice by methods of drainage and long-continued fixation.

H. A. MCKNIGHT.

**Blair, E.: Delayed Suture of Simple Flesh Wounds.**

*Am. J. Surg.*, 1919, xxxiii, 178.

The author deals solely with simple flesh wounds not involving vital organs or including wounds of the bones. These formed the largest percentage of cases in the base hospitals of the American Expeditionary Forces.

From a military standpoint the treatment of such simple flesh wounds was most important as, when properly managed, nearly all patients could be returned to some grade of duty if not to the front lines, and the mobility and efficiency of the hospital depended upon the speed with which such patients could be cured and evacuated.

While the Carrel-Dakin treatment with delayed suture is an ideal method when properly carried out, its use was not possible during the stress of a "push" with the inadequate facilities and assistance available and the great and insistent demand for beds. Under ideal conditions primary suture after excision is the method of choice at evacuation hospitals where the patients can be held for four days or longer.

In the author's experience at a base hospital the wounds which showed clean raw surfaces of muscle or fascia with practically no granulations came from evacuation hospitals forty-eight to seventy-two hours after the primary operation. No attempt was made at extensive bacterial study but many of the wounds showed bacterial counts of less than one to five fields after the first dressing and a few of these were sutured immediately on arrival with excellent results. It was not feasible to perform immediate suture on a large scale, however, as the patients came in convoys of three to five hundred and it required from two to three days to classify and treat the emergency cases.

Treatment preparatory to closure is of two types: (1) intermittent instillations with Dakin's solution, and (2) the application of simple wet dressings of bichloride of mercury or Thiersch's solution.

When the Carrel method of sterilization was employed faithfully as described by Carrel and Dehelly, the results were striking and within forty-eight to seventy-two hours the wounds appeared clear and healthy. But these results could be obtained only if careful attention was paid to every



detail of the technique. Any deviation impaired the result, and as the service grew, errors in technique became common because of inadequate facilities and changing personnel.

The second method of preparation mentioned is much more simple and requires no skill and training in dressings. It consists of the application of wet packs of Thiersch's solution (borosalicylic) or Burow's solution (aluminum acetate) which are changed daily. When treated in this way the wounds were ready for suture within a few days. The surgeons learned to rely upon the clinical appearance of the wound and often sutured successfully those in which the bacterial count showed large numbers of bacteria per field.

The suturing was of three types: (1) suturing when the wound was sterile; (2) suturing after denudation or complete re-excision of the wound; and (3) suturing after curettage of all fresh granulations down to their film of scar.

By far the greater number of wounds were closed according to the second method. The results of the first method were not gratifying as 50 per cent of the wounds became infected either from the wound surface or from small cysts of pus under the flat surface of granulation. According to the second method the skin about the wound, the wound itself, and the granulations were thoroughly iodinated and the skin edges and granulations dissected off in one piece if possible as soon as the wound looked ready for suture. The skin was then undermined to permit proper coaptation and the wound flooded with ether, sponged dry, and sutured. A primary union was the result. Other advantages were that time was saved as the peroperative work could be done by untrained assistants, the anatomical approximation was better, and infection was less common. W. L. STRANBERG.

**Watkins, T. J.: The Care of Suppurating Wounds Following Abdominal Section.** *Surg. Clin. Chicago*, 1919, iii, 601.

Watkins advises the avoidance of all the procedures usually employed, i.e., the removal of the sutures, drainage, re-opening the wound, and irrigation. Instead he advocates the application of moist dressings over the wound as soon as infection is discovered. These dressings should be covered with protective tissue or paper and changed sufficiently often to keep the wound comparatively clean. In about five days all induration and redness will disappear, only a little seropurulent discharge will remain, and the opening will be reduced in size. When completely healed, there is little or no evidence of suppuration.

The advantages claimed are: (1) the injury done the wound by the suppuration is slight; (2) the patient is not greatly disturbed either physically or mentally; and (3) the time before recovery is shortened as when the suppuration stops there is very little wound left to heal.

He further states that the wound will drain with-

out the removal of the sutures as long as the wet dressing remains applied. The sutures protect against hernia and leave a small wound for healing after suppuration ceases. The sutures should be removed only when they cut the tissues.

L. R. GOLDSMITH.

**Yates, A. L.: A Note on Immunized Skin Grafts.** *Lancet*, 1919, cxcvii, 324.

By the method described an attempt was made to immunize the skin from which the graft was to be taken to the toxins of the wound for which the graft was intended. A dressing which had been in contact with the wound to be grafted and soaked with its discharge was placed upon an area of skin suitable for obtaining Thiersch grafts and left in place for twenty-four hours. It was then replaced by another similar dressing. These dressings were applied for seven days, at the end of which time the graft was removed. The skin so treated became reddened and on the third day showed a slight prominence of the papillæ. Care was necessary at this point to guard against a violent reaction. If such a reaction occurred, treatment was stopped for a day. Those cases in which there was no reaction were considered to possess an immunity to the organism of the wound and this view was apparently borne out by the fact that the graft took readily.

The grafts were applied to the wound in the ordinary manner and covered with perforated waterproof tissue. Aside from a gentle syringing to remove discharges every two or three days, no further treatment was necessary.

The author reports 27 cases treated in this manner without a failure. Three of these were cases which had failed to give results by ordinary methods, 10 were cases of ecthyma which had resisted treatment for several weeks, 13 were cases of lacerated wounds which were slow to heal, and 4 were cases of chronic ulcer. In all instances a certain amount of mobility of the limb was allowed. W. J. TUCKER.

#### ASEPTIC AND ANTISEPTIC SURGERY

**Latouche, P.: The Healing of War Wounds and Their Antiseptic Treatment with Vincent's Dry Borohypochlorite Dressings** (De la réunion des plaies de guerre et de leur traitement antiseptique par le pansement sec boro-hypochlorité de Vincent). *Arch. de méd. et pharm. mil.*, 1919, lxxi, 189.

Latouche refers first to the efficacy of Vincent's borohypochlorite powder at the first-aid stations. His clinical experiences have confirmed the claims that the use of the powder limits infection and permits deferring surgical operations when for any reason this is necessary or expedient. He mentions a case in which a wound was kept in good condition in this manner for five days before operation. On the basis of his experience with borohypochlorite dressings he has been led to use them



in his ambulance service instead of the Carrel method.

Vincent's powder is a mixture of 10 parts of hypochlorite of lime and 90 parts of powdered boric acid. The mixture is preserved in colored glass flasks. It is neither caustic nor toxic; its application is painless, and the presence of calcium chloride gives it a hæmostatic quality which is of great value. It dissolves very slowly and its antiseptic action is therefore much prolonged. A powdered wound dries, does not suppurate, and assumes a pale reddish tint. Clinical practice has confirmed the laboratory findings that bacterial flora rapidly disappear from wounds treated with the powder.

In the author's ambulance service he used the powder after the complete surgical operation, shaking it in a thin coating between the muscles, etc. In closed wounds the powder may be injected into all the crevices of the wound with the help of an assistant and a sterilized glass insufflator.

Latouche points out that in many services where the more elaborate equipment required for the Carrel and other methods is not available the use of borohypochlorite powder is of especial value.

With regard to primary suture the author states that he is inclined to limit its application, especially in the hands of young and inexperienced surgeons. In war, particularly, the surgeon may not be able to devote the time to the care of the patient that is demanded by primary suture. Moreover, there is always the possibility that not all of the infected portion of the wound has been completely excised. Surgical sterilization in such cases must be supplemented by chemical sterilization and in such event the borohypochlorite powder is of manifest efficacy.

W. A. BRENNAN.

### ANÆSTHETICS

**Hinojar: The Value of General Anæsthesia Induced by Means of Ether-Oil Injections into the Rectum in Otorhinolaryngological Surgical Operations** (Utilidad de la anestesia general por la mezcla etéreo-oleosa en inyección rectal en las intervenciones quirúrgicas otorinolaringológicas). *Med. Ibero*, 1919, Número extraordinario, I Cong. nac. de med. y cirug., 103.

The principal advantage of general anæsthesia over local anæsthesia is that with the loss of sensation there is also loss of consciousness.

In some ear, nose, and throat cases anæsthesia by inhalation is extremely inconvenient.

Ether anæsthesia induced through the rectum solves the problem of obtaining insensibility and unconsciousness without interfering with surgical operations on the neck, mouth, face, nose, and ears.

The ether-oil mixture in suitable quantity and proportion gives a regular and lasting anæsthesia.

The technique of its use is extremely simple and the after-care required is insignificant.

No special preliminary preparation of the patient is necessary.

It may be difficult for very small children to

retain the mixture but this can be overcome by a previous brief inhalation of chloroform.

The face should be covered with a folded cloth in order to hasten relaxation and prolong the duration of the anæsthesia as long as possible.

If there is delay in obtaining anæsthesia or if during the operation the patient shows signs of regaining consciousness prematurely, profound anæsthesia may be obtained by pouring a few drops of chloroform on the layer of cloth.

Rectal ether-oil anæsthesia should not be employed in the cases of patients who are suffering from any form of acute or chronic intestinal trouble or for very short operations. It appears to be undesirable also for patients with cancer of the upper respiratory passages.

M. M. MATTHIES.

**Eggleston, C., and Hatcher, R. A.: A Further Contribution to the Pharmacology of the Local Anæsthetics.** *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 433.

One fact of fundamental importance has emerged from the authors' investigations, namely, that the "essential" elimination of all the local anæsthetics studied, except cocaine and holocaine, proceeds with great rapidity and is completed within a few minutes following the intravenous injection of a sublethal dose. The "essential" elimination of cocaine and holocaine is a much slower process, and that of cocaine may not be complete after periods of from one to two or more days. The elimination of all of the local anæsthetics in the cat has been shown to be accomplished by their destruction in the liver, as demonstrated by perfusion of that organ with solutions of the several drugs. In view of the close similarity of the behavior of the human body to toxic doses of local anæsthetics, it is highly probable that man eliminates these drugs in the same way as the cat, especially since such rapid elimination by the kidney is most improbable.

The local anæsthetics may be divided into two groups according to their rate of destruction or "essential" elimination in the cat: Group 1, which is made up of those which are rapidly eliminated, includes alypin, apothetin, beta-eucaine, nirvanin, procaine, stovaine, and tropacocaine. Group 2, which is made up of those which are slowly eliminated, includes cocaine and holocaine. This grouping apparently applies also to these anæsthetics as used for man.

The prompt recovery of the cat following the intravenous injection of a just sublethal dose of any of the members of Group 1 is due to the rapid destruction of these drugs, while slower destruction in the case of cocaine and holocaine explains the less rapid and complete recovery after corresponding doses of the members of Group 2.

The ability of the cat to withstand repeated intravenous injections of large fractions of the minimal fatal intravenous doses of the members of Group 1, when given at intervals of fifteen to twenty minutes, and to survive the slow and continuous in-



jection of several times the average fatal intravenous dose, depends upon the rapid "essential" elimination of these drugs. The animal's inability to withstand similar injections of corresponding amounts of the drugs of Group 2 is due to their slower elimination.

The "essential" elimination also explains the relative low toxicity of the members of Group 1 when administered subcutaneously as well as the rapid recovery of man from non-fatal acute poisoning by the members of Group 1. MAX KAHN.

**Farr, R. E.: Abdominal Surgery Under Local Anæsthesia.** *J. Am. M. Ass.*, 1919, lxxiii, 391.

The personal element enters largely into the question of the advantages of local over general anæsthesia. Some of the advantages of local anæsthesia are enumerated in this article. The local anæsthetic is safer. The use of epinephrin which permits more deliberate work gives the surgeon a control over the blood supply which the author believes is superior to that offered when operating under a general anæsthetic and therefore enables him to combat hæmorrhage more efficiently. Moreover, as of necessity the tissues must be very carefully handled, there is less trauma and less shock, and nausea, vomiting, and their associated dangers are absent.

The anæsthetic of choice is 0.5 per cent procaine in Ringer's solution combined with 5 drops of epinephrin to the ounce. In all but cases of hernia direct infiltration is used which is accomplished with the aid of a pneumatic injector. The author makes one primary intradermal wheal and then pushes the needle entirely through the skin, infiltrating the line of incision in the skin from beneath. By careful injection of the various layers, he obtains complete relaxation of the abdominal wall.

All cases of pelvic disorders of a simple nature lend themselves well to the use of a local anæsthetic as do also those requiring intestinal resection and gastric, duodenal, and gall-bladder operations.

R. B. BETTMAN.

**Guthrie, D.: Trendelenburg Anæsthesia in Surgery of the Pelvis.** *J. Am. M. Ass.*, 1919, lxxiii, 388.

Trauma of the small intestine is one of the direct causes of postoperative shock and ileus. For this reason the author handles the small intestine as little as possible. When the patient is placed in a high Trendelenburg position before the anæsthetic is begun the pelvis will be found practically free from coils of small intestine and therefore the handling necessary to obtain a clear field is obviated. If after the abdominal wall is opened the operator gently pulls the lower angle of the wound up, the in-rush of air into the peritoneal cavity aids in forcing back any loops of small bowel which might still be down. In the discussion of this paper Ochsner stated that it does not matter very much just when the use of the Trendelenburg position is begun so long as it is started several minutes before the inci-

sion is made. Ochsner and Balfour both place their patients in the Trendelenburg position after they are unconscious rather than before beginning the administration of the anæsthetic. R. B. BETTMAN.

## SURGICAL INSTRUMENTS AND APPARATUS

**Rockey, A. E.: Drop-Ether Pharyngeal Anæsthesia and Apparatus for Aseptic Anæsthesia in Plastic Facial Surgery.** *Am. J. Surg.*, 1919, xxxiii, Anæst. Supp., 89.

Rockey claims that while the devices in general use for vaporizing ether for intrapharyngeal anæsthesia have proved satisfactory, it is not possible to secure even an approximately aseptic field for operations about the mouth as none of them protect the field from mouth secretions or permit the use of efficient antiseptics. Such asepsis may be obtained by providing a safe airway for respiration through which the anæsthetic may be given. This must securely block the larynx from blood or antiseptics strong enough to sterilize the surface and, after the site of operation has been cleansed, protect it from re-infection by the mouth secretions.

The author claims that in a very large class of these cases a method by which ether is inhaled by mouth through a large pharyngeal tube and cofferdam of gauze packing properly placed is superior to any other. In this way an efficient block between the operative field and the respiratory tract, so necessary for the performance of ideal operations in this region, is afforded and makes possible a degree of asepsis in the operation not possible by any other method.

The inhaler which Rocky has devised consists of a curved airway adapted to the mouth and pharynx. The open and slotted end should be so placed that it rests just above the larynx back of the epiglottis. This inhaler is provided with a movable joint which makes it possible to turn the tube upward for operations involving the mouth and neck and downward for those performed upon the face and head. The nasal tubes are attached to a Y-tube so curved that the stem may be firmly fixed over the nose by a strip of adhesive plaster which insures stability and prevents obstruction in kinking. The inner diameter of the pharyngeal tube is  $\frac{1}{2}$  inch and that of the connecting rubber tube  $\frac{3}{4}$  inch. A practical working length of the tube is 30 inches. The funnel of spun metal is provided at the top with crossed curved wires to support the gauze cover and surrounded by a groove in which fits a coiled spring to hold the gauze in place. The inhalation tube is so arranged that it is not possible to pour liquid ether into it. The opening to admit air directly in the inhalation tube is placed in the bulb of the handle at a convenient place for finger control.

After complete anæsthesia is established the pharyngeal tube is introduced or, in a comparatively few cases, the nasal tubes are placed. The posterior part of the mouth is then well packed with gauze.



Much depends on the thoroughness and care with which this is done. The gauze pack forms the necessary dam of protection both for the respiratory tract and for the field of operation. The inhalation tubes, pharyngeal and nasal, may be held in place by an adhesive strip applied around or over them and attached to the forehead or face as the character of the operation admits. If this is carefully done a satisfactory anaesthesia may be maintained without interference.

It is essential that the ether be given by an anaesthetist who is able to maintain safely such a degree of anaesthesia as will prevent any attempt at vomiting which might clog or displace the tube and and destroy the asepis of the operative field.

The inhaler described gives drop-ether from what is practically an open mask as the finger of the anaesthetist at all times has an instant touch control of the air mixture.

I. C. HERB.

**Lawrence, D. H.: A Splint Method for the Treatment of Fractures of the Clavicle.** *Mil. Surgeon*, 1919, xlv, 231.

The author illustrates by photographs the steps in the application of a new fixation splint for fractures of the clavicle in healthy adults such as soldiers in the field. This splint consists essentially of a well-padded board, 20 by 4 inches in size, which is applied transversely across the spines of the scapulae while the patient lies on his back and is held firmly in place by two wide plaster of Paris bands which cross diagonally at the middle of the board and pass under the shoulders as a figure of eight. The long ends are firmly bound to the chest by a separate plaster bandage which includes also the extremities of the board. By this means the shoulders are held firmly in the desired position while the arms are free.

E. M. MILLER.

**Foster, W. J.: A Thomas Arm Splint with a Flexible Elbow.** *Brit. M. J.*, 1919, ii, 237.

The writer states that there is need for improvement in the type of splint used for the treatment of fracture of the elbow-joint and describes a splint which may be applied to either arm and is useful also in the treatment of fractures of the humerus and forearm. This consists of a shoulder ring with a strap passing around the chest with a buckle attached. Two pieces of metal with a jointed elbow extend on either side of the arm from the shoulder ring to the wrist and an extra two inches of the upright pieces below the joint is fitted with an extension bar. The splint is completed by a strap attached to the outer metal pieces about 6 inches above and below the joint and fitted with a buckle for extension and flexion. Flannel bandages are used around the arm and splint from the axilla to below the elbow.

In the author's opinion this splint offers the best chance for the restoration of function in the elbow and greatly lessens the danger of ischaemic paralysis.

In treating the fracture, the arm is put up at

right angles, and each day as the swelling diminishes the strap is shortened  $\frac{1}{2}$  to 1 inch at a time until the elbow is flexed as much as is safe with due regard to the amount of swelling present. The limit of flexion having been reached in about a week, the strap is lengthened inch by inch until the forearm is extended to at least half the normal. The amount of flexion or extension is increased as the pain and swelling decrease and the bandages are removed from the forearm daily for massage.

The extension bar is more rigid in this splint than in the Thomas arm splint, and in fractures of the humerus traction may be made by passing a flannel bandage over the elbow-joint and knotting it below the bar. In fractures of the forearm it is possible to maintain supination and at the same time make a daily variation in the position of flexion and extension.

The author does not use this splint for fractures of the surgical neck of the humerus as he finds that such fractures do well when a pad is placed in the axilla, the arm is bandaged to the chest wall, and early massage and passive movement are instituted.

R. B. MARTIN.

**De Martel, T.: Gastric Surgery. A Method of Clamping** (Chirurgie gastrique; méthode de l'écrasement). *Presse méd.*, Par., 1919, xxvii, 374.

While the Mayo écraseur is a great improvement in instruments for clamping the stomach, it is far from perfect as it is too long and heavy and does not hold the viscera with sufficient security.

De Martel has devised a new type of écraseur which he describes in detail. This instrument consists of two clamping blades of equal length which can be articulated and disarticulated easily at one end. In order to bring them into contact great force is required and this is obtained by the use of a specially powerful long-handled forceps designed for the purpose. When the écraseur is closed the open ends of its blades hook into each other by a tenon and mortise arrangement. When closed on the viscera it is impossible to open it and the stomach would be torn before it could slip between the blades.

One of the great defects of all other instruments is that they do not prevent the cut edge of the viscera from slipping through the clamping blades. The author claims that in his écraseur the clamping force exerted is uniform at all points. He has used the instrument in many gastrectomies and intestinal resections and found it better than all others. He has had no fear that the gastric cavity would open in the midst of the operative field, and because of the security obtained, his operations have been rendered as aseptic as the removal of a uterine fibroma.

W. A. BRENNAN.

**Greenberg, G.: A New Operating Composite Cysto-Urethroscope.** *Ann. Surg.*, 1919, lxx, 212.

The new composite cysto-urethroscope is so made that either air or water can be used as a



medium when examining the bladder and urethra. It has both the direct and indirect systems of observation.

The instrument consists of the following parts:

1. Three tubes each 17 centimeters long and 25 millimeters wide. One of these is straight and has a straight obturator for use in the anterior urethra. One has its distal end cut at an angle of 45 degrees and is fitted with an adjustable obturator which may be bent at an angle or may be used straight. Another has its distal end cut at an angle of 30 degrees which gives a large operating field in the posterior urethra.

2. Two light carriers, one for topical applications with air dilatation and one in combination with a deflector for use when catheterizing the ejaculatory ducts. This combination of light carrier and deflector has one catheter channel for the introduction of a No. 5 bougie or catheter. A lens which is permanently attached to the deflector is used only in a water medium.

3. A magnifying system which consists of two sets of observation lenses that can be attached easily to the proximal end of the light carriers.

4. Two operating windows, one for air and one for a liquid medium.

5. The usual accessories for topical applications and operations within the urethra.

The author claims the following advantages for his instrument.

1. A wide field of application in the bladder and urethra of both the male and the female.

2. Lesions of the posterior wall of the bladder are

more easily accessible to this than to the rectangular vision cystoscope.

3. Its simplicity of construction, together with its ease of manipulation, makes it adaptable to various operative procedures in the bladder and urethra.

4. The deflector makes it possible to reach any part in the urethra without injury to the tissues.

5. It is especially useful for fulguration of tumors, and inflamed areas in the urethra, and for the destruction of glands and cysts.

6. The cautery may be used for the destruction of median prostatic bars, air being employed instead of fluid as a distending medium.

The article contains twenty illustrations, together with an appendix of several colored plates of normal and pathologic conditions of the posterior urethra.

G. J. THOMAS.

**Slesinger, E. G.: A Pneumatic Injector for Local Anæsthesia.** *British M. J.*, 1919, ii, 139.

The apparatus which the author has designed for making injections for local anæsthesia when a large quantity of solution is to be used is extremely simple. The essential portion of it is a graduated cylinder in the top of which are a tube and a tap to which an ordinary bicycle pump may be attached. The cylinder is made air-tight by suitable caps. Pressure is maintained and the fluid is controlled by a button on the injection valve.

Slesinger cites the advantages afforded by this apparatus as compared with the ordinary syringe. The simplicity of its construction appears to be one of its most commendable features. W. J. TUCKER.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Ney, K. W.: Observations on Gunshot Injuries of the Head.** *N. York M. J.*, 1919, cx, 229.

It was our failure to appreciate the importance of early wound excision, the evil effects of drainage, and the possibility of primary suture after excision that for so long kept the operative mortality in brain injuries above 50 per cent. Patients having brain injuries of this nature die usually an anatomical death within the first twenty-four hours or, escaping this, die an infective death after six to ten days or even after many months. It is to the prevention of these infective sequelæ that the author directs our attention.

During Ney's earlier experience in the French service in 1915 he saw patients with brain injuries coming back from the front area with the most distressing infections. At that time it was believed that such conditions were the result of transportation. The author, however, attributes them not to transportation but to the nature of the operation in which the infected and devitalized tissues were not removed and successful drainage was often

blocked in the endeavor to promote it by the use of gauze.

The operative procedure employed chiefly at that time was the enlarging of the scalp wound for drainage and exploration, or the formation of a large osteoplastic flap around it. In either case the devitalized soft parts were not removed and only the more superficial bone fragments and foreign bodies were picked out. Little attention was paid to subdural adhesions which, in the endeavor to complete a speedy operation, were often torn, thus opening the subarachnoid space to infection.

An interesting fact in connection with military brain surgery was that it was never possible to judge the condition of deeper structures by the appearance of the scalp wound. Not infrequently it was found after operative investigation that what appeared to be a most trivial scalp wound was really an extensive fracture with extensive subdural involvement. The same might be said also with reference to the appearance of the external table of the skull. Here a small depression or simple fissure when trephined usually proved the existence of much shattering or fragmentation of the internal table.



In the investigation of scalp wounds the external table occasionally showed no evidence of trauma, and in such cases the scalp was sutured without further interference. When the preliminary neurological examination gave evidence of intracranial involvement, the skull was opened at the point of injury and usually a non-pulsating, discolored dura was disclosed. In such cases dural incision was practised, providing infection had not become established. With the incision of the tense dura a quantity of disorganized brain substance and blood clots was extruded, after which the normal pulsations would reappear and the relief of tension would permit an immediate closure of the dura by suture. This procedure was possible because of the early excision of the traumatized area before infection had become established. The opening of a tense, discolored, non-pulsating dura after a careful excision and cleansing technique was a routine procedure and to the author's knowledge was never followed by subdural infection. If practised later, in the presence of a definitely established infection, such a procedure would be open to criticism.

In gunshot injuries of the brain it was not considered advisable to resort to spinal puncture because in open cases after the withdrawal of fluid by this means there were always associated the danger that the brain would recede and the possibility that established subdural adhesions which had closed the subarachnoid space around the traumatized area might be torn.

Many cases of cranial injury showing both bone and dural defects revealed on removal of the dressings applied at the first-aid station a greater or less quantity of extruded disorganized brain substance which continued to ooze from the wound during the process of preparatory shaving and during the operation. A conspicuous feature in these cases was the large amount of cerebral destruction possible without the production of general cerebral symptoms when there was immediate traumatic decompression.

It was the author's observation that the shock of cerebral trauma was much greater when the latter was inflicted under general anaesthesia than without it. He found that under local anaesthesia it was possible to proceed with the same operative technique without pain or interference from the patient and with the complete elimination of the shock element which had previously been so disastrous. With improvement in technique he found it possible to produce complete anaesthesia in less than ten minutes. The infiltration of the scalp so reduced the bleeding that when the incision was made much time was saved in that only the larger vessels required clamping, while very often the field was bloodless. The hæmostatic effect of the infiltration always lasted through the operation or sufficiently long for clotting to take place in the constricted vessels.

The anæsthetic used was 1 per cent novocaine solution to which was added a 1:1000 solution of

adrenalin chloride in the proportion of 15 drops to 30 cubic centimeters of the novocaine solution. Morphine,  $\frac{1}{4}$  grain, was given one-half hour before operation.

After shaving the entire head and making as complete a neurological examination as circumstances would permit, the operative technique used by the author's team at the front was the complete excision of the scalp wound, avoiding contact with the lacerated edges, the removal of the area of bone injury *en bloc* by cutting around it with a De Vilbiss rongeur, lifting the bone block out as one piece, and not allowing the instruments to come in contact with the infected tissues in the center of the piece removed. The evacuation of the disorganized brain substance was rapidly effected by having the patient cough or blow, after which a soft rubber catheter was inserted to palpate any retained foreign bodies or bone fragments which had not been expressed by the blowing. Finger palpation was not used.

In ventricular penetrations it was found possible, after removal of the semifluid brain substance by the method described above, to insert long, narrow retractors and remove foreign bodies under direct inspection. When the ventricle was not involved and the toilet of the brain tract was completed, a 2 per cent solution of dichloramine-T was usually introduced. This was allowed to run out during the completion of the operation. Often the dura was so badly lacerated as to preclude the possibility of suture. In such cases the defect was covered with a piece of paracranium which was found to be as satisfactory as grafts of fascia lata. In other defects which could not be closed by suture, the opening was covered simply by suture of the scalp, which proved satisfactory in every way. The scalp was always closed by primary suture and if this could not be done without tension the defect was covered with the flap or some other tissue, even though it might be necessary to rob another portion of the skull of its covering. The brain lesion was never drained, the only drainage ever used being just a small piece of rubber glove placed in one angle of the incision and removed the next day at the first dressing.

The article is to be completed in the next issue of the journal. G. W. HOCHREIN.

**Chutro, P.: Cartilaginous Cranioplasties, Indications and Techniques.** *Internat. J. Surg.*, 1919, xxii, 227.

A loss of substance of the cranial bones produces certain subjective and objective signs and symptoms grouped under the name "trephine syndrome". This syndrome occurs in lesions of the bone and dura mater and the superficial layers of the brain with no differentiated function. When the cerebral substance of the motor or special sense zones is also involved, the syndrome of the latter condition is observed in addition to the clinical signs of the corresponding organic lesion.



Properly performed, plastic skull operations are usually followed by the disappearance of the syndrome but the concomitant organic lesions are not benefited directly. Jacksonian epilepsy is sometimes improved by cranioplasty, the attacks being diminished in number, severity, and duration although total disappearance is uncommon. Epilepsy also may be improved by this procedure.

The aim in cranioplasty must be twofold: (1) the prevention of the faulty cicatrix, and (2) the prevention of the trephine syndrome. Long experience with war surgery has taught that all faulty cicatrices of the body should be extirpated because they impede function, create abnormal adhesions, restrict the action of muscles and joints, and have a marked tendency to ulcerate and maintain foci of infection. The extirpation of skull cicatrices is obligatory. In cases of simple infected scalp lesions the cicatrix is apt to become keloidal and painful. When trephining has been done, the cicatrix is always adherent to the meninges and even to the brain. It therefore causes constant traction and thereby continuous irritation of the meninges. Superficial cicatrices are lined with a greatly thickened or keloidal layer which has a tendency to spread in the cerebral substance, giving rise to a series of invariably grave secondary phenomena. These phenomena are part of the trephine syndrome. Other signs frequently observed are as follows:

1. A sensation of emptiness in the trephined side.
2. A similar unpleasant sensation felt when the patient is obliged to stoop or lower the head, make some effort, or cough. This sensation manifests itself in the form of vertigo and nausea. When the patient is in a sitting position, a depression is seen at the site of the loss of substance, and when he bends, a hernia appears in the same place, this being due to the movement of the brain.
3. Intolerance of external vibrations such as the rolling of a train.

In addition there is a series of small signs differing with different persons and largely referable to disturbances resulting from variations in the pressure of the intracranial fluid due to the solution in the continuity of the skull cap. These signs subside following cranioplasty.

The contra-indications to cranioplasty are: (1) infection; (2) the presence of intracerebral foreign bodies; (3) hyperpressure, even slight, with oedema of the papillæ; (4) irreducible cerebral hernia; (5) a lesion of the occipital region with visual disturbances; and (6) recurrent epilepsy which does not improve on prolonged rest in bed. Beside these cases there are always special cases in which intervention will be considered inadvisable.

Cartilage grafts are to be preferred and if possible, they should be live grafts. With few exceptions the operation is performed under local anæsthesia, 1 per cent novocaine and adrenalin solution being used. A hypodermic injection of morphine is given an hour before the operation.

The two chief steps in the operation are: (1) the

preparation of the cranial gap, and (2) the removal of the cartilaginous graft. Drainage is indispensable since it is almost impossible to obtain perfect hæmostasis and in the absence of drainage hæmatomata are formed between the scalp and the graft and sometimes cause the elimination of the graft. At the end of forty-eight hours the drain should be removed.

In none of the cases operated upon in two years had the graft been absorbed. On the contrary it had hardened and thickened, and had become blended with the bones of the skull though it remained transparent to the X-rays.

H. H. FREILICH.

**Inigo Nougues, M.: Is There Concussion of the Brain without Fracture of the Skull?** (*¿Existe conmoción cerebral sin que se haya producido la fractura del cráneo?*) *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y ciruj., 54.

While concussion of the brain is often accompanied by objective lesions of the cerebrum or its coverings and blood vessels, there are also cases in which there is no material injury of either the skull or its contents. Moreover, grave traumata with contusion, fracture, hernia, and even loss of cerebral substance at times produce a clinical picture which, so far as it concerns concussion, is very insignificant, disappears very rapidly, and leaves no trace whatever.

The author therefore concludes:

1. That concussion of the brain may occur without fracture of the skull.
2. That this condition depends essentially upon an intracranial disturbance of the circulation and a discharge of the potential energy normally stored up by the nerve cells.
3. That the treatment of concussion is based upon the suppression of every kind of stimulus which induces the discharge of neuromotor potential energy and upon measures favoring the oxygenation of the nerve centers.
4. That lumbar puncture is not only a therapeutic means which often gives brilliant results, but also a very important factor in the diagnosis and prognosis since the withdrawal of a red-tinged spinal fluid demonstrates the presence of lesions which otherwise would be revealed only by autopsy.

M. M. MATTHIES.

**Hennessy, R. V.: Remarks on Fracture of the Mandible in the Vicinity of the Angle.** *Med. J. Australia*, 1919, ii, 88.

The author cites a case of fracture of the mandible at the angle of the bone on either side. Skiagrams showed an unerupted impacted third molar tooth on each side at the site of fracture. The left molar lay at right angles to, and across, the line of fracture and acted as a splint.

Immobilization was accomplished by wiring the teeth of the island fragment of the mandible to those of the maxilla in correct dental occlusion. However, although eight teeth were wired, the anchorage thus secured was not sufficient to stand the strain fou



longer than one week. After three weeks of immobilization, there was firm union on both sides and no callus was perceptible. Facial symmetry was unaffected and biting, although with slight inferior protrusion, caused the patient little inconvenience.

Observations of three other cases revealed the fact that the four-tail bandage method of treatment is wholly inadequate for routine purposes because the

bite is so seriously interfered with that the jaw cannot be satisfactorily brought together. External splints should not be used. The wiring method is eminently efficacious. The necessary factors are an adequate number of clean teeth and a fairly definite dental bite. Oral hygiene can be maintained easily with a tooth brush and hydrogen peroxide.

P. H. KREUSCHER.

SURGERY OF THE CHEST

CHEST WALL AND BREAST

Gage, H.: *Empyema. Boston M. & S. J.*, 1919, clxxxi, 84.

The author reviews two series of cases of empyema observed at Camp Devens. Those of Group 1 occurred during the winter of 1917-18 and followed an epidemic of measles and pneumonia. Those of Group 2 followed the epidemic of influenza and pneumonia which occurred in the autumn of 1918.

The following tables present a good résumé of the series:

	Group 1			Group 2		
	No.	Deaths	%	No.	Deaths	%
Cases operated upon	43	0	21	45	9	20
Cases not operated upon	17	8	47	11	3	27
Undiagnosed until autopsy	17	17	100	5	5	100
Total	77	34	44	61	17	28

TIME OF ONSET OF EMPYEMA

	Group 1	Group 2
In first week	27	5
In second week	19	1
In third week	6	13
In fourth week	7	11
In fifth week	1	9
Beyond sixth week	0	17
Total	77	56

BACTERIOLOGY OF PLEURAL EFFUSION

	Group 1		Group 2	
	No.	Died	No.	Died
Pneumococcus alone:				
Cases operated upon	8	0	24	5
Cases not operated upon	14	11	4	1
Streptococcus alone:				
Cases operated upon	26	8	8	2
Cases not operated upon	14	10	3	0
Pneumococcus and streptococcus:				
Cases operated upon	7	1	4	0
Cases not operated upon	0	4	0	0
Unknown:				
Cases operated upon	2	0	7	2
Cases not operated upon	0	0	4	2
Influenza bacillus:				
Cases operated upon	0	0	2	0
Cases not operated upon	0	0	0	0
Total	77	34	56	12

TIME OF OPERATION

	Group 1	Group 2
	No. Died	No. Died
On first day of empyema	6	3
On second day of empyema	10	4
On third day of empyema	2	0
After third day of empyema	25	2

The incidence of empyema to pneumonia in this series was as follows:

Group 1: 485 cases of pneumonia with 77 cases of empyema (16 per cent).

Group 2: 2,000 cases of pneumonia with 61 cases of empyema (3 per cent).

In both groups the after-treatment consisted of simple drainage. In several of the second group Carrel-Dakin irrigation was used. In cases with wide-open drainage improvement was rapid.

The author concludes that in determining the time of operation the all-important factors are preliminary aspiration, the character of the fluid, the rapidity of re-accumulation, and the mechanical interference with respiration.

Regarding the type of operation he states that intercostal thoracotomy was found sufficient in 60 per cent of the cases while in the remaining 40 per cent costectomy was necessary. The latter should be done as soon as it is evident that drainage is not sufficient.

V. P. DIEDERICH.

Fiessinger, N., Wertheimer, P. L., and Meyer, J.: *Plastic Pernicious Anæmia in the Course of a Pyopneumothorax Due to the Bacillus Perfringens; Serotherapy; Recovery* (Anémie pernicieuse plastique au cours d'un pyo-pneumothorax à perfringens. Séro-thérapie. Guérison). *Lyon chirurg.*, 1919, xvi, 89.

The authors give the full clinical history of a curious case of pernicious anæmia which they observed in the course of a pyopneumothorax due to the perfringens bacillus. This was a case of a wound of the left lung from which the projectile had been extracted with excision of the affected tissues and suture of the lung and soft parts. Eight days later there were signs of pleural infection and punctures yielded a fluid from which pure perfringens bacilli were cultured. The general condition of the patient became such that death was believed imminent.

Serotherapy with Weinberg's anti-perfringens serum was then instituted, altogether 200 cubic centimeters of the serum being injected with good results. Soon, however, the patient showed excessive pallor and all of the other classic symptoms of anæmia accompanied by slight icterus. Attention was immediately turned toward the state of the blood, but there was no evidence of hæmolysis. It was then decided that this was a case of pernicious anæmia of infectious type extremely rapid in its evolution. In six days the red corpuscles fell from 1,800,000 to 600,000 per cubic millimeter. The anæmia was plastic. The leucocytosis oscillated between 30,000 and



15,000 leucocytes due to the infectious process and the hæmatopoetic reaction. The blood repair, however, was just as rapid as the destruction and within six days more the number of red corpuscles again rose to 1,500,000.

During this period the cause of infection remained the same but on the disappearance of the anæmia the authors did a pleurotomy which the patient withstood very well. This operation had been deferred previously owing to his general condition.

The curious evolution of the anæmia raises a biological problem of great importance. Why and how did the infection provoke the hæmatic syndrome? It is known that *in vitro* anaerobes are powerful agents of hæmolysis. *In vivo* this hæmolysis is manifested by a peculiar pallor and by changes in the blood picture.

From the beginning the patient showed signs of intense intoxication with slight icterus and signs of hepatic insufficiency such as urobilinuria and glycosuria.

In addition to the remarkable clinical effects of the injections of serum the authors direct attention to a peculiar fact observed in the organic defense. In the pleural liquid tapped the *perfringens* bacilli were found agglutinated in masses. This agglutination is very rarely observed *in vivo* and the bacillus is difficult to agglutinate *in vitro*. Probably, therefore, it was due to the agglutinating power of the Weinberg serum as it occurred subsequent to the injections.

W. A. BRENNAN.

**Meyers, J. A.: Studies of the Mammary Gland. VI. The Development of the Mammary Gland from Its Earliest Appearance Until the Period of Pregnancy.** *Am. J. Dis. Child.*, 1919, xviii, 4.

The mammary gland is first represented in the embryo by the "mammary streak," a single layer of elongated epithelial cells extending on each side from the anterior to the posterior limb bud. By proliferation of these cells resulting in the formation of several layers is formed the "mammary line" which is slightly elevated above the epidermis. The cell proliferation then continues only at intervals along the line and in this way forms what are called "mammary hillocks." The intervening portions of the line gradually disappear. As the hillocks grow they sink into the subjacent mesenchyma and begin to bud from their deeper surfaces.

The buds which divide progressively and sink into the mesenchyma represent the future "milk ducts." In man there are from 15 to 20 primary buds in each hillock. The lumen of the milk duct in man begins to develop about the sixth or seventh month and is formed either by a re-arrangement or a degeneration of cells. At birth the ducts show considerable branching and soon after birth secretion appears in the milk ducts of human infants. This secretion, which may cause marked engorgement, is usually carried away by leucocytes or direct absorption within the next twenty days. In children born

postmaturely secretion may be present at birth and in those born prematurely it may not appear for many days or not at all. The secretion contains all the constituents of true milk but it has not been determined whether the stimulus which induces activity in the mammary glands of the mother is the same as that which excites the glands of the new-born to secrete "witch's milk."

The stroma of the mammary gland develops from remnants of the mesenchyma about the mammary hillocks. As the mammary hillock sinks into the mesenchyma its superficial surface becomes depressed below the level of the surrounding epidermis by a process of degeneration and desquamation by which is formed the "mammary pit." Very soon a small papilla forms in the base of the pit, constituting the beginning of the nipple which grows till it fills the pit. In many cases the nipples of new-born infants have not yet reached the surface of the surrounding epidermis, in others they fill the mammary pit, while in the remainder they are slightly elevated. Usually the nipples become elevated shortly after birth and are of adult size and form at puberty. In man each of the 15 to 20 milk ducts has a separate "milk pore" in the surface of the nipple. In about 7 per cent of human embryos supernumerary mammary glands develop along the course of the original mammary streak.

In lower animals severe inanition for a short time at an early age temporarily stunts the mammary glands. When the animal is refed the glands respond slowly.

Comparison of the sexes shows that in man "witch's milk" is secreted by both sexes, that up to puberty the milk ducts branch somewhat more in the female, that the male mammary gland may show some growth after puberty, and that retrogressive changes are apparent in the male gland after the thirtieth year.

C. D. HAUCH.

## TRACHEA AND LUNGS

**Lilienthal, H.: Full Exploration of the Thorax in Recent Wounds of the Lungs.** *Am. J. Surg.*, 1919, xxxiii, 177.

Since spicules and fragments of rib projecting into the chest are a source of danger to the lung from infection and trauma, an exploratory opening must be made so that the inner aspect of the wound of entrance may be examined from within. This is especially important when the wound of entrance is small and not near the area of election for the main operation.

A large incision in the seventh interspace with wide rib retraction by means of a powerful spreader will permit the examination of all parts of the thorax and in the majority of cases make rib cutting unnecessary.

Closure is easily effected by approximating the ribs with pericostal sutures of chromic catgut or kangaroo tendon. Pleural sutures are not necessary provided the edges of the pleural wound are turned outward



and held while the ribs are crowded together by the sutures around them. Muscles and fascia are closed with interrupted chromic catgut. In war wounds primary suture of the skin is not advisable.

During the operation some form of differential pressure is essential. The author prefers positive intrapharyngeal insufflation.

As well illustrating the advantages of the wide exploration made possible by an incision in the seventh interspace, a recent case in civil practice is reported. In this instance a 32-caliber bullet had penetrated the chest over the left nipple and lodged posteriorly beneath the pleura in the ninth interspace, having traversed the lung and fractured the fourth rib. There was shock and full hæmothorax. The patient was examined twenty hours later. The blood pressure was 120, 80, the pulse, 120, and the respiration, 40. The hæmothorax was evacuated by trocar and cannula and an X-ray examination was made to locate the bullet. Intrapharyngeal anaesthesia with gas-ether was used. An incision was made in the seventh interspace and the ribs then retracted.

The spicules of bone were then removed by working from within. A hæmatoma was found in the lower lobe and the wound of exit was pouting and oozing. The bullet having been removed from its bed beneath the parietal pleura, the wound was closed with the lung partly collapsed and the use of pericostal sutures, the pleura being everted. At the wound of entrance the surrounding skin, pectoral fascia, and muscle were excised. No suture was made. The patient had an uneventful recovery and was discharged in twenty days.

W. L. STRANBERG.

### PHARYNX AND ŒSOPHAGUS

**Le Fort, R.: The Extraction of War Projectiles from the Thorax.** *Med. Rec.*, 1919, xcvi, 190.

On the basis of his large experience in chest surgery Le Fort reports that the prognosis of thoracic wounds is greatly improved by active measures aiming at the direct treatment of the wound during the first few hours, namely, mechanical cleansing of the parts, hæmostasis, and extraction of foreign bodies, just as in wounds of other regions.

Retained foreign bodies give the following symptoms: cough, hiccough, vomiting, dyspnœa, sometimes cardiac palpation, and recurring hæmoptysis. The most common symptom is dyspnœa on exertion. The rule therefore should be to remove all intrathoracic projectiles except very minute fragments.

All intrathoracic projectiles may be extracted, there being no prohibited zone; the entire lung, the entire mediastinum, and the heart and its cavities may be freed from such foreign bodies.

A complete radiological study must precede intervention to remove intrathoracic projectiles, and the operation should be safeguarded by the control of the screen. Resections of ribs and cartilage should be carefully avoided in operations performed

by the anterior or lateral routes, the dissection of flaps or rib retraction being better procedures.

Small and medium-sized projectiles in the pulmonary parenchyma at a distance from the hilus and the mediastinum should be treated by extraction with forceps pushed through the tissues in the direction of the projectile while the operator follows the movements of the forceps on the radioscopic screen according to the procedure of Petit de la Villéon.

The fear of pneumothorax has long been a stumbling block to the progress of intrathoracic surgery, but this condition is remarkably well tolerated when the myocardium is not seriously diseased. It is not a more serious matter to open the pleura than to open the peritoneum, and flattening of the lung against the vertebral column when the thorax is opened occurs only in the cadaver.

The heart is a viscus the hardness and strength of which are truly remarkable. It may be moved about and raised without fear. Pressure on the ventricles accelerates its action, while pressure on the auricles slows it.

The omission of postoperative drainage of the pleura is the most reliable means of avoiding infection and other complications. H. A. MCKNIGHT.

**Halstead, A. E.: Diverticula of the Œsophagus.**

*Surg. Clin. Chicago*, 1919, iii, 667.

Inability to swallow granular food, such as rice, beans, etc., is usually the first symptom of a diverticulum of the Œsophagus. Later the inability to swallow becomes more marked and includes all food. Occasionally the patient is able to swallow only when in the recumbent position. In some cases after the sac becomes filled food passes on into the stomach without further hindrance. Regurgitation is an almost constant feature. In some instances the food regurgitated is that which was ingested several days previously. Pain is often present and is relieved by regurgitation. Frequently a tumor appears in the neck as food is eaten and disappears after regurgitation. The history, the tumor, the X-ray findings, and the inability to pass a stomach tube or an Œsophageal bougie more than a very limited distance readily establish the diagnosis.

The etiology of Œsophageal diverticula is embryonic, the result of pressure from within the Œsophagus or tension resulting from inflammatory or traumatic changes in the neck or mediastinum from without.

Palliative treatment consists of daily lavage of the sac. The rational treatment, however, is surgical intervention. The author advocates a two-stage operation. In the first stage the sac is freed from the connective tissues of the neck and its bed packed with gauze. In the second stage the sac is amputated and the neck invaginated into the Œsophagus by means of a purse string. The advantage of packing the bed of the sac is the fact that the tissues of the neck are walled off by granulations.

R. B. BETTMAN.



**Sheldon, L.: Rupture of the Œsophagus.** *U. S. Nav. Med. Bull.*, 1919, xiii, 529.

While on board ship returning from Brest, France, a soldier reported at the sick bay in a condition of partial collapse. He was sweating profusely and the skin and mucous membranes were very pale. His temperature was 96.6, pulse 78, and respiration 18. He was constipated, had been seasick, and had vomited several times, and his appearance was that of intense seasickness. About an hour previous to reporting he had felt a sudden sharp pain in the left chest which had become steadily worse. Examination of the left chest revealed diminished breath sounds, moist râles, and increased resonance. After stimulation and the application of heat he rested more easily for a few hours. Then it was found he could not defecate, and this with the condition of partial shock and a distended and tender abdomen led to a diagnosis of intestinal obstruction. Death occurred suddenly. Just before death it was noticed that the left side of the neck was swollen and over it was the characteristic feeling of subcutaneous emphysema. The duration of the condition was nine and one-half hours.

When at autopsy the thoracic cavity was opened, foul smelling gas escaped. The left pleural cavity was found to contain about one quart of dark brown fluid with the odor of feces combined with that of stomach contents. In the fluid were large pieces of undigested meat, corn, and beans. The left lung was totally collapsed. Just above the diaphragm was a clean-cut rupture of the œsophagus involving about one-half of its circumference and extending

about 1 inch upward. Except for this rupture the œsophagus was normal in appearance and showed no scars or evidence of former disease. The rupture was probably brought about by the pressure caused by straining at stool when the stomach was distended by gas which had accumulated as a result of intestinal obstruction. The condition was masked by apparent seasickness.

I. W. BACH.

### MISCELLANEOUS

**Gwyn, N. B.: Notes from the Service for Wounds of the Chest.** *Canadian M. Ass. J.*, 1919, ix, 702.

In a brief review of the 450 chest wounds passing through his station from March to December, 1917, the author emphasizes the importance of careful observation and grouping of cases.

The wounds complicated by the gas bacillus often had a chronic course. Eleven of 23 patients died, 7 being dangerously ill on their arrival. Several of the chest infections developed as late as two or three weeks after the primary operation, presumably because of the persistence of the organisms in some remote corner or small clot.

The routine treatment of empyema was resection, drainage, and irrigation by the Carrel-Dakin method. In 13 of 20 cases the wounds which had been debrided and sutured at the casualty clearing station had to be re-opened. The other 7 required no further treatment. Two cases of late infected hæmothorax which the author operated upon by cleaning out the pleural cavity and closure of the wound proved fatal.

E. M. MILLER.

## SURGERY OF THE ABDOMEN

### GASTRO-INTESTINAL TRACT

**Sundberg, H.: Phlegmonous Gastritis** (Ueber Gastritis phlegmonosa). *Nord. med. Arkiv.*, 1919, li, Inre Med., 303.

Although phlegmonous gastritis is considered a rare condition, Sundberg has been able to collect the records of 198 cases from the literature. To these he adds 17 cases observed in his own clinical service up to 1917, making a total of 215 cases, all of which he tabulates with the bibliographical references.

In the 215 case reports, the sex is stated in 195. One hundred and forty-three of these patients were men and 52 women. The ages varied from 20 to 60 years. Only 8 per cent of the patients belonged to the wealthy or leisure classes. Twenty-five per cent were addicted to alcohol. In the author's 17 cases there was a history of chronic gastritis with a very diminished secretion of gastric juice and achylia.

The infecting bacteria may reach the stomach directly from a focus in the mouth, being borne by infected sputum, or the infection may be hæmatogenous and enter the stomach through defects in the muscle or mucosa of the stomach wall. The in-

flamed condition of the gastric mucosa and the constant achylia render the stomach wall peculiarly vulnerable to streptococcal attack.

The most characteristic symptom is pus in the vomitus. Abdominal pain is also constant. In intensity and character the pain resembles that due to a perforated gastric ulcer. Usually, however, it subsides when the patient sits up after lying down. As a rule, also, the high fever is a symptom differentiating this condition from ulcer.

According to many authorities the greatest danger in phlegmonous gastritis is peritonitis, but Sundberg finds that in one-third of the cases there was little or no peritonitis.

The condition has an extremely bad prognosis. There may be spontaneous recovery but in the non-operated cases the mortality was 92 per cent. The logical surgical treatment is resection of the affected part of the stomach.

W. A. BRENNAN.

**O'Connor, J. H.: Perforation in Gastric and Duodenal Ulcers.** *California State J. M.*, 1919, xvii, 293.

Only 8 cases of perforating ulcers of the stomach and duodenum were encountered in a series of 26,000



cases admitted to the Southern Pacific General Hospital. None of these was diagnosed before admission. The chief symptoms in order of their value were:

1. Pain and tenderness. The pain is sharp, cutting, burning or stabbing, and localized mostly in the epigastrium, although at times it may radiate to the right iliac fossa, thus suggesting appendicitis.
2. Rigidity of the abdominal muscles, which is very marked, often board-like in character, and localized in the upper abdomen.
3. Vomiting, which, though not a striking feature, occurs in most cases.

A history of previous ulcer symptoms is of great aid in establishing the diagnosis, but often, and especially in cases of duodenal ulcer, cannot be elicited.

The prognosis is favorable if the diagnosis is made and the operation performed within the first few hours of perforation, but grows steadily worse as the time between perforation and operation increases. After twelve hours it is grave.

The author's operative technique consists of closure of the perforation with a layer of chromic catgut followed by a layer of silk and a third layer of iodinated catgut. The gastrocolic or gastrohepatic omentum is included in the last suture. The abdomen is closed without drainage except when the perforation cannot be sutured satisfactorily. It is not advisable to do a gastro-enterostomy. According to the Mayos, a perforated ulcer is a cured ulcer.

The after-treatment consists of placing the patient in Fowler's position and treatment by proctoclysis with a glucose sodium bicarbonate solution in tap water.

R. B. BETTMAN.

**Friedenwald, J.: A Case of Perforated Gastric Ulcer with Abscess Formation; Perforation through the Lung, with Spontaneous Recovery.** *Am. J. M. Sc.*, 1919, clviii, 179.

The article reports a case of perforated gastric ulcer with the formation of an abscess which opened and drained through the lung. It gives also a brief résumé of the literature.

The patient, aged 51, gave a family and personal history which was negative except that he had had periods of indigestion for the past thirty years. These attacks were characterized by eructations, pyrosis, constipation, frequent nausea, and slight vomiting, and by pain which began two hours after meals and was relieved by alkalis. At no time, however, was there vomiting of blood or retained food, the stools had never been tar-colored, and there were no kidney symptoms. The history was negative also as regards venereal infection.

During the attack reported the patient was seized with severe and agonizing pain over the left epigastrium which was accompanied by distention and distinct tenderness of an epigastric area. His temperature ranged between 101 and 103 degrees. Cough and hiccough then developed and were followed shortly by purulent expectoration which the first day amounted to approximately 1 quart.

Following this, the temperature receded and the pain diminished.

At the time of examination the patient, who was thin and poorly nourished, had much respiratory discomfort. His tongue was coated and there was pyorrhœa alveolaris. The abdomen was distended slightly, the recti were spastic, and there was a tender area in the epigastrium. The blood examination showed 11,900 leucocytes with 70 per cent polynuclears. The X-ray examination revealed the presence of an ulcer at the pyloroduodenal juncture and a slight bronchiectasis.

After admission to the hospital a gradual decrease in the expectoration was accompanied by a gradual fall in the temperature. One week later the patient was discharged as well.

In 1894 Maydl reported 179 cases of subphrenic abscess of which 35 were due to perforation from the gastro-intestinal tract.

Subphrenic abscesses may be extra- or intra-peritoneal and are always unilateral. Those on the right side are found between the liver and the diaphragm while those on the left side occur between the diaphragm, the stomach, the spleen, the transverse colon, and the left lobe of the liver. The abscess is an encysted localized peritonitis of varying size and usually contains gas. The presence of colon bacilli in the pus shows that the gastro-intestinal tract is the origin of the infection.

As a rule the symptoms are acute, but they may develop slowly. Those which are most common are epigastric pain, marked dyspnoea, vomiting, hiccough, fever, and expectoration of pus.

The article is closed with a review of four cases reported in the literature.

P. M. CHASE.

**Balfour, D. C.: Surgical Treatment in the Bleeding Type of Gastric and Duodenal Ulcer.** *J. Am. M. Ass.*, 1919, lxxiii, 571.

Various complications, such as acute and chronic perforation, obstruction, deformity, malignant degeneration, and hæmorrhage, may develop in direct connection with gastric and duodenal ulcer and present to the surgeon added problems. One of the most important of these is hæmorrhage.

Gastric hæmorrhage has been the cause of more confusion in diagnosis, uncertainty in therapeutic indications, and irrationality in treatment both medical and surgical than perhaps any other gastric condition. This paper is concerned chiefly with two groups of cases: first, those in which operation proved unsatisfactory because of error in attributing the bleeding to a lesion which was not present, and second, those in which the surgical procedure carried out failed to obviate further hæmorrhages even though a correct diagnosis was made.

The first group of cases, namely, those in which no intrinsic lesion is present, is very important and requires careful study as to the cause of the hæmorrhage; the hæmatemesis may be due to such extrinsic causes as the pancreas, appendix, gall-bladder, spleen, or liver.



As regards the second group of cases, the records of the Mayo Clinic show that 25 per cent of gastric ulcers and 20 per cent of duodenal ulcers have been complicated by one or more gross hæmorrhages. In the earlier days of gastric surgery the operation of gastro-enterostomy proved to be so efficient in the treatment of a large majority of benign lesions of the stomach and duodenum associated with hæmorrhage that the realization came rather slowly that at least some of the failures to obtain a complete cure, including protection against further hæmorrhage, could be attributed to the fact that direct attack on the ulcer was not added to the indirect therapeutic measure of gastro-enterostomy. The first impetus to the practice of combining gastro-enterostomy with the radical excision or destruction of such ulcers was given by the recognition of the danger of malignant degeneration in gastric ulcer. The advisability of this principle is now well established and was shown in a series of 2,875 ulcers of the duodenum operated upon between Jan. 1, 1906, and Jan. 1, 1918. Twenty per cent of the patients had gross hæmorrhages before operation and 63 of these reported hæmorrhages at some period following operation. Twenty patients who had not had hæmorrhage before operation reported hæmorrhages after operation.

The incidence of hæmorrhage is definitely higher in duodenal ulcer following operation than in gastric ulcer, notwithstanding the fact that there is a greater tendency for gastric ulcer than for duodenal ulcer to be complicated by bleeding. A study of the types of operations done in these cases gives a clue to the reason why operation failed to protect against further hæmorrhages. In not one of the 83 cases in which hæmorrhages occurred after operation for duodenal ulcer was the combined operation of excision of the ulcer with gastro-enterostomy carried out, and with the exception of 8 cases in which various types of pyloroplasties were done, a gastro-enterostomy alone was done in every case. This fact is significant, particularly when a comparison is made of the results of the established methods of excision and gastro-enterostomy in gastric ulcer in which, although the tendency to hæmorrhage was greater, the percentage of cases of bleeding following operation was much smaller. The combined procedure of excision and gastro-enterostomy was carried out in only 1 of the 17 cases of gastric ulcers which bled after operation. These facts can mean only that the methods of direct attack combined with gastro-enterostomy which are used in the treatment of gastric ulcer today are a protection to the patient against further hæmorrhage.

From a study of the Clinic cases it was perfectly evident that in both duodenal and gastric ulcers, gastro-enterostomy alone was insufficient to protect the patient against further hæmorrhages, and that excision combined with gastro-enterostomy gave almost total protection.

The use of the cautery is advocated as a very effi-

cient means of carrying out excision in this group of cases, and inasmuch as some ulcers bled after operation which had not bled before operation, it is justifiable to adopt the practice of destroying all ulcers that are reasonably accessible. This destruction can be accomplished in a very safe and efficient manner by means of the cautery.

#### Horsley, J. S.: A New Operation for Duodenal and Gastric Ulcer. *J. Am. M. Ass.*, 1919, lxxiii, 575.

Following a discussion of gastro-enterostomy, pyloroplasty, and the Heineke-Mikulicz operation, the author presents a surgical procedure intended to obviate their faults.

The clinical results of gastro-enterostomy are by no means perfect. Balfour reports 159 cures in 285 cases (55.7 per cent) while Smithies reports less than 50 per cent of complaint-free results in 273 cases. The chief faults are the fact that the stomach is not restored to its normal physiological condition, the pylorus continues to function unless resected, and the anastomosis is not made at the physiological emptying point (the pylorus) where the current of pressure and peristaltic rhythm of the stomach have always been focused. As the pain of ulcer is due to the pressure of peristalsis on the nerves, it is relieved by gastro-enterostomy because the emptying of the stomach is facilitated and the peristalsis thus decreased.

Finney's method of pyloroplasty is almost always employed today. In Finney and Friedenwald's last report the results were regarded as satisfactory in 93.6 per cent. It is not stated, however, whether this implies "complaint-free." Objections to this procedure are based upon the difficulty often experienced in mobilizing the duodenum, the danger of bleeding from vessels of the greater curvature, the permanent impairment of the pylorus, and, when there is scar tissue around the pylorus, the suturing of scar tissue to scar tissue.

The Heineke-Mikulicz procedure is criticized adversely because of the creation of a pouch with slight constriction both on the stomach and duodenal side, the lack of room for the incision unless mobilization of the duodenum is done, the suturing of scar tissue to scar tissue, and the tendency of the healing processes to draw the pylorus up under the liver.

The author compares ulcer in ano and duodenal or pyloric ulcer and states that the new operation is founded on the treatment of the former, i. e., physiological rest of the sphincter for a short while, cauterization or removal of the diseased tissue, and later restoration of the sphincter function. The steps of the operation are then given in detail and profusely illustrated.

The advantages of the new operation are:

1. It removes the obstruction and the pathologic condition, and permits the normal resumption of the stomach function.

2. The ends of the sutured incision are within the stomach wall. The ratio of the incision should never be less than two parts in the stomach to one



in the duodenum. Usually 2 inches in the stomach and 1 inch in the duodenum are sufficient. The anterior stomach wall in the midline can be readily pulled over to the first inch of the duodenum.

3. There is no pouch formation as in the Heineke-Mikulicz operation in which the center of the incision is at the pylorus.

4. The parts to be put at rest are the parts most concerned in contraction and relaxation.

5. The function of the pylorus and pyloric end of the stomach is not permanently destroyed. The stomach wall is brought over as a link between the ends of the pyloric sphincter and in the course of time (usually a few weeks) the sphincter resumes its action though, because it has been enlarged, it cannot become spastic as it was before the operation.

6. The operation is more simple than the Finney operation in which it is necessary to mobilize the duodenum and suture the posterior and the anterior margins of the wound separately.

Four cases are reported in all of which a complaint-free condition was obtained. In a series of 11 patients operated upon by this method, 2 died from postoperative hæmorrhage. In one instance the hæmorrhage was due to incising a cicatricial band too deeply and in the other to extension of the old ulcer because of too light suturing of the mucosa and rupture of a large blood vessel in the base of the extension.

X-ray studies of 5 postoperative cases showed that the pylorus had returned to its function and appeared to be somewhat more open than usual.

P. M. CHASE.

**Carman, R. D.: The Roentgen Diagnosis of Gastric Ulcer.** *J.-Lancet*, 1919, xxxix, 402.

The author emphasizes the need for thorough familiarity with the roentgenologic appearance of the various types of normal stomachs as the first essential in diagnosis. Reflex manifestations from extragastric disturbances are very apt to prove troublesome in their differentiation from pathologic conditions within the stomach. The roentgen method offers a means of distinguishing double lesions which is hardly possible by the older methods of examination, and many lesions may be discovered earlier in this way than by clinical findings alone.

According to the author's statistics, nine-tenths of the ulcers of the stomach give distinct roentgenologic indications of gastric disease. Of the four types of gastric ulcer seen at operation, the small, shallow mucus erosions may give no roentgen signs or at most only such secondary signs as incisura and six-hour retention. Penetrating or callous ulcers with relatively deep craters show a bud-like prominence or niche on the peripheral outline of the stomach. Perforating ulcers producing an accessory pocket show the opaque meal in them capped by a small gas bubble, and they may retain their contents after the stomach empties itself. The carcinomatous ulcer in a small percentage of cases is

impossible to differentiate roentgenologically. Extreme size of an ulcer crater should lead to the suspicion of malignancy. In a general way, ulcers always project from the gastric contour, while in carcinoma the growth with its resultant irregularity extends into the gastric lumen. In some instances pyloric ulcer, like pyloric cancer, may show only a six-hour residue and an atypical irregularity, in which case the roentgenologist may say with certainty only that a lesion exists but cannot determine its nature.

Another roentgen sign of gastric ulcer is the hour-glass stomach. This may be organic or spasmodic, or both. The organic type associated with ulcer usually assumes the shape of the letter "B," most of the constriction occurring at the expense of the greater curvature. It is due to permanent changes in or about the gastric wall and may be increased by spasm of the circular muscle fibers. The hour-glass stomach associated with cancer differs from it in usually being X-shaped, with a long irregular canal centrally placed. Organic hour-glass constrictions are persistent at successive examinations, constant in situation, and not affected by manipulation or medication, differing in this way from the spasmodic type. The latter may be of extrinsic or intrinsic origin. If due to extragastric lesions, they will disappear if antispasmodics are given to physiological effect. Persistence in spite of this invariably means an intragastric lesion.

A distinct residue in the stomach after six hours, amounting to a quarter or more of the quantity taken, was found to be a relatively common accompaniment of gastric ulcer. It was observed in 55 per cent of a series of 215 consecutive cases. Its presence usually designates a pathologic condition in the stomach or duodenum but is looked upon only as a contributory sign.

ADOLPH HARTUNG.

**Mayo, C. H.: Cancer of the Stomach and Its Surgical Treatment.** *Ann. Surg.*, 1919, lxx, 236.

The greatest number of cancers occur in the area of highest acidity, the stomach. More than one-third of the cancers in men and more than one-fifth of those in women develop in this organ. Ninety-eight per cent of intestinal cancers are in the colon. Cancer of the small intestine is rare, about 2 per cent.

In making a general survey of the various theories and reviewing the clinical evidence concerning the etiology of gastric cancer, it seems that not one but several conditions are essential to its development. The change from the normal cell to the cancer cell is not great. In a general way it may be said that the nucleus is proportionately larger in the cancer cell than in the normal cell and is ready for division with less than the average amount of cytoplasm surrounding it. When a cell exhausts its controlling granules in division and, reverting to primitive life, becomes parasitic, we may have the beginning of cancer, but only if other factors are present, such as an acid condition which undoubtedly stimulates cancer growth, or a greatly lowered alkalinity. Con-



cerning the normal division of a cell it is reasonable to assume that the brain directing its division comes from the centrosome; possibly other granules may serve this purpose.

From Oct. 1, 1897, to Jan. 1, 1919, 2,094 operations for cancer of the stomach were performed at the Mayo Clinic. Seven hundred and thirty-six of these were resections with a mortality of 13.7 per cent; 746 were explorations with a mortality of 2.9 per cent; and 612 were palliative operations with a mortality of 11.1 per cent. The common type of operation was the Mikulicz, Hartmann, Billroth No. 2, of which there were 359 with a mortality of 12.5 per cent. There were 19 of the Billroth No. 1 type with a 5 per cent mortality, 28 sleeve resections, and 7 Kocher operations with a mortality of 14.2 per cent each, 115 posterior Polya operations with a mortality of 14.7 per cent, and 120 anterior Polyas with a mortality of 13.3 per cent. The local resections, 12 in number, gave the highest mortality, 25 per cent. These 660 resections have been done since 1906. Prior to this date the type of resection was not described in the records definitely enough to be included in a statistical report.

For the last three years the anterior instead of the posterior Polya operation has been done in the Clinic. Better after-results seem to be obtained by turning the bowel to the right, closing the end of the stomach in toward the lesser curvature, and protecting the closed portion by suturing the unopened bowel over it.

Four hundred and twenty-seven patients were operated upon during the three years previous to September, 1917. Those who died in the hospital and those not heard from number 121. Those who recovered from the operation and who have been heard from number 306; 115 (37.6 per cent) of these have three-year cures. Three hundred and thirteen patients were operated upon during more than five years before September 1, 1917. Those who died in the hospital and those not heard from number 79. Those who recovered from the operation and who have been heard from number 234; 59 (25 per cent) of these have five-year cures. This is a most satisfactory showing for the surgical relief of an otherwise hopeless condition which is attended by much suffering.

**Woodburn, C. M.: Pyloric Stenosis in Infants.** *Pennsylvania M. J.*, 1919, xxii, 701.

Woodburn reviews the literature on the subject of pyloric stenosis in infants and brings out the interesting fact that from the time of the first reported case in 1787, one hundred and twenty years elapsed before this type of stenosis was recognized as a surgical condition and the first operation was performed for its relief.

The etiology of pyloric stenosis in infants is an unsolved problem but in general there are two views: (1) that there is a congenital pyloric thickening which progresses after birth, and (2) that there is a resultant spasm and hypertrophy from some primary

irritation. The first hypothesis seems to be more generally accepted.

The cardinal symptom, both in order of appearance and as a diagnostic aid, is vomiting. This is usually of sudden onset and rapidly assumes a forceful character.

Of equal importance to the vomiting is the visible peristaltic wave which manifests itself shortly after the ingestion of food. This is a characteristic and conclusive symptom and will confirm the diagnosis.

A third characteristic sign is a pyloric tumor which, however, is not always detected.

Pylorospasm may simulate pyloric obstruction which is found in older children of neurotic temperament and is associated with nervous symptoms such as restlessness, a tendency to cry, rigidity of the abdominal walls, poor appetite, etc. In the latter condition, however, the vomiting is less apt to be forceful in character, the peculiar peristaltic wave is absent, and no tumor can be palpated.

The treatment of pyloric stenosis with marked obstructive symptoms is operative intervention, the earlier the better. Gastro-enterostomy and pyloroplasty are the operations most commonly performed, the latter as modified by Rammstedt being the method of choice. The stomach having first been emptied, the usual incision splitting the right rectus is made under ether, and the pylorus exposed. The pyloric tumor is then grasped between the thumb and fore-finger and the hypertrophied muscle incised in the direction of the long axis down to the mucosa. The incision is spread apart so as to allow the thickened mucosa to pout into the wound which is covered over with omentum and permitted to remain open. The advantage of this operation is its simplicity, quickness, and freedom from shock.

H. A. McKNIGHT.

**Condon, A. P.: The Treatment of Acute Gastromesenteric Ileus.** *Ann. Surg.*, 1919, lxx, 107.

Gastromesenteric ileus is an obstruction of the upper part of the gastro-intestinal tract due to compression of the terminal duodenum. This is due to the sagging of the small intestines into the pelvis, which causes a pulling on the root of the mesentery which in turn compresses the duodenum so as to obliterate its lumen. The author has demonstrated this condition in 6 cases, in 4 at operation and in 2 at autopsy.

In gastromesenteric ileus the stomach and duodenum alone are dilated. Lavage empties them, leaving the abdomen scaphoid.

The condition may follow operation or diseases requiring long confinement to bed. The author has observed its occurrence after kidney fixation, amputation of the leg, mastoid operations, and in 2 cases in which there had been no operation.

The usual treatment is gastric lavage and postural methods or laparotomy to lift the intestines out of the pelvis and release their mesenteric pull.

The author's treatment consists in the injection of 2,000 to 3,500 cubic centimeters of Ringer's



solution into the peritoneal cavity to float the intestines upward. The addition of glucose, 500 cubic centimeters, delays the absorption of the solution and combats the acidosis which may be present. After the injection the patient is placed in a sitting position.

The author has treated 8 well-developed cases in this manner. K. L. VEHE.

**Jackson, J. N.: Acute Gangrenous or Perforative and Suppurative Retrocæcal Appendicitis.**  
*Illinois M. J.*, 1919, xxxvi, 1.

The retrocæcal position of the appendix is more common than usually believed and in such cases the channels of the spread of infection are different from those followed when the appendix is in the more usual position. The resulting difference observed in the syndrome has led to many errors in diagnosis.

The first stage in the development of appendicitis, namely, the stage when the appendix alone is involved, is characterized by the usual signs and symptoms. The second stage, however, the stage in which the adjacent structures, usually the peritoneum, are affected, is marked by an entirely different syndrome. Because of the retrocæcal position of the appendix, the peritonitis is more apt to remain localized and therefore there is little or no muscular rigidity. The air cushion which the distended cæcum interposes between the area of inflammation and the palpating hand may prevent pressure on the infected region and therefore the standard sign of pain on pressure may be absent.

The proper diagnosis of this type of case will require (1) an accurate detailed elicitation of the symptoms of the first twenty-four to forty-eight hours; (2) an appreciation of the fact that the later signs of appendicitis are chiefly those of peritonitis and that in the retrocæcal appendix this peritonitis is confined to the limited space outside of, and largely behind, the cæcum and colon; (3) the evidences of continued infection; (4) slight stiffness and distinct tenderness on pressure above the crest of the ilium in the lumbar region.

The treatment is of course surgical. In all cases it is best, when possible, to remove the appendix *in toto*. The author attributes most of his success in gangrenous or perforative and suppurative retrocæcal appendicitis to the insertion of a drain through a stab wound in the lumbar region. This takes care of the basin above the iliac crest in the lumbar fossa which, when the patient is in a recumbent position, does not drain through a tube placed down near the stump of the removed appendix. An anterior drain also is inserted. R. B. BETTMAN.

**Short, A. R.: Observations on the Ileocæcal Valve in Man.** *British M. J.*, 1919, ii, 164.

The author had an opportunity to observe the action of the ileocæcal valve in a patient who had had a cæcostomy for dysentery. He states first that it is perfectly obvious that the ileocæcal

valve should be regarded as a sphincter rather than a valve as it is oval in shape and has a well-marked ring of muscle surrounding it. When the sphincter is contracted it is about  $\frac{3}{4}$  inch long and grips the inserted finger quite firmly.

The essential factor in bringing about activity of the sphincter is the ingestion of food by mouth. This never fails. The time of the reflex is one and one-half to four minutes. When activity begins, the sphincter relaxes and may measure  $1\frac{1}{2}$  inches across. The folds of the ileal mucosa come into view. Having relaxed, the sphincter does not contract again until activity ceases, differing in this respect from the pylorus.

The further observations following the intake of food showed first that there is an exit of gas and then a gush of liquid orange or brown fæcal matter which comes through in amounts of about  $\frac{1}{2}$  ounce at a time at intervals of about half a minute. This goes on while the food is being taken, and for a variable time, usually about an hour afterward, unless the food consists only of a biscuit or glass of milk, in which case the orifice ceases to discharge after twenty minutes or so. Undigested foods, such as currants, take about six hours to come through from the mouth to the ileocæcal valve.

On one occasion the author obtained pure succus entericus which he explains by the fact that no fæcal matter was present in the terminal inches of the ileum. He showed by actual tests that the activity of the sphincter is not influenced in any way by acid or alkaline solution. Moreover, limited observations did not show any influence on the emptying of the stomach by irritation of the cæcal mucosa. Local stimulation of the cæcum near the orifice definitely delayed the outflow, and the author considers this of considerable importance as bearing on the question whether chronic inflammation in the ileocæcal region, as for instance chronic appendicitis, can delay the passage of bowel contents through the sphincter.

The observations as to the effect of enemata by rectum do not agree with former reports inasmuch as in this case they did not provoke any activity of the ileum or the discharge of ileal contents.

D. C. BALFOUR.

#### MISCELLANEOUS

**Meyer, W.: Transthoracic Laparotomy.** *Ann. Surg.*, 1919, lxx, 172.

The author states that in cases of injury by way of the chest to organs in the vault of the diaphragm, it has been found best to attend to the damage wrought in the chest first and then try to reach and deal with the injured abdominal organs by means of a transthoracic laparotomy, i. e., by either deliberately incising the diaphragm or enlarging its wound. Sauerbruch was the first to proceed systematically along these lines. He reports three cases successfully operated upon, in all of which a differential air-pressure apparatus was employed. Sauer-



bruch lays stress upon the importance of incising the diaphragm transversely or obliquely to the direction of its fibers rather than parallel with them, in order to avoid injury to the phrenic nerve.

Meyer gives a rather full report of a case of accidental gunshot injury which was operated upon by him in January of this year. In this case the bullet had entered the thorax in the sixth intercostal space, fractured the seventh rib, and had become lodged in the convexity of the liver as found at operation. The case presented many interesting features. Pus was unexpectedly discovered in the liver, pointing to the presence of a beginning hepatic abscess and demonstrating the wisdom of the decision to operate. It proved also the importance of operating under differential air pressure in such cases inasmuch as, contrary to expectation, the pleural cavity was found absolutely free from adhesions. Hence, the otherwise inevitable occurrence of an acute pneumothorax was avoided. In view of the unknown character of the pus, drainage was

considered the only safe course. The patient made an uninterrupted recovery.

On the basis of his own experience as well as the cases of transthoracic laparotomy reported in the literature, the author concludes that probably it is best to remove bullets in thoracic as well as abdominal organs; that the decision as to whether operation should be done immediately after the accident or later depends upon the seriousness of the concomitant symptoms; and that if not accessible from below, simultaneous injuries to the chest and abdomen as well as injuries to the convexity of the liver or the spleen without previous penetration of the chest render the indication for transthoracic laparotomy. Involvement of intra-abdominal organs can be made out before or during thoracotomy. Meyer holds that these operations are best done with the help of differential pressure apparatus. He believes further that air and water-tight drainage of the chest (Kenyon's) is the safest procedure for the after-treatment.

## SURGERY OF THE EXTREMITIES

### DISEASES OF BONES, JOINTS, MUSCLES, TENDONS. GENERAL CONDITIONS COMMONLY FOUND IN THE EXTREMITIES.

**Gallie, W. E.: Chronic Septic Inflammation in Bone Following a Gunshot Wound. *J. Orthop. Surg.*, 1919, i, 470.**

The conclusions based upon extensive clinical and experimental studies are as follows:

The periosteum is the medium by which the blood vessels are distributed to the shafts of the bones. Reflection of this membrane produces superficial necrosis and should never be done when sepsis is present or feared.

The periosteum as reflected in an ordinary surgical operation is merely a fibrous tissue membrane and is not osteogenetic. Therefore it should never be relied upon to restore the shaft after resection.

Mild chronic septic infection is a strong stimulant to inflammatory osteogenesis. It causes widespread osteoporosis, increased vascularity, and abundant callus-formation. This is the state in which cavities are most apt to heal and fractures to unite, unless prevented by some definite condition such as the presence of sequestra or too large a gap.

When the irritation subsides or disappears, this rarefying osteitis gives place to an intense sclerosis which is very unfavorable for the healing of cavities or the union of fractures.

Treatment should therefore take advantage of the pathologic condition which is present at the time the sequestra have separated, and its aim should be to effect a complete cure before osteosclerosis has supervened. It should consist of the complete excision of the scar and sinus and the wide removal of the walls of the cavity for the purpose of thorough

evacuation of sequestra and unhealthy granulation tissue. All irregularities and pockets must be obliterated, and when possible the depth of the cavity should be reduced by allowing the soft structures to fall into it. Pedunculated muscle or fascia flaps are of great assistance in promoting rapid healing. Finally, wide-open drainage must be provided so that the cavity may heal from the bottom without depending upon the dangerous alternative of a narrow sinus.

Taylor's liquid-tight closure apparatus, with the use of 10 per cent salt solution, is of great value in cleansing these wounds before operation and in the treatment of postoperative sepsis.

Non-union of compound fractures uncomplicated by great loss of bone is rare. When present, the fact that the wound is septic is not a contra-indication to active treatment of the fracture as well as of the osteomyelitis. Gratifying results may be anticipated from thorough freshening of the ends and adjustment of the fragments, providing efficient drainage is secured.

The best time to correct mal-union in septic cases is at the time of the operation for the cure of the disease in the bone.

PHILIP LEWIN.

**Eisendrath, D. N.: Injuries of the Joints in War and in Civil Life. *Surg. Clin. Chicago*, 1919, iii, 497.**

Closed injuries of joints seen in war differ very little from those in civil life, but in open injuries there is much greater destruction and more likelihood of infection. The synovial membrane, like the peritoneum, will take care of a moderate amount of infection and the infection tends to become localized. The tissues for a distance of 1 centimeter from the track of the projectile are devitalized and



as a rule if this track can be excised within the first twelve hours and all foreign material removed, the wound may be closed by primary suture. Wounds from rifle and machine-gun bullets do well under conservative treatment, while those due to high explosive missiles demand complete early débridement. Active mobilization of joints, as advocated by Willems, may be employed in civil as well as in war surgery. Five case reports are given.

Case 1. Compound fracture of the olecranon process followed by severe infection of the elbow-joint. The upper fragment was removed to facilitate Carrell-Dakin treatment of the wound. The result was fibrous ankylosis of the elbow in a favorable position.

Case 2. Very severe crushing injury of the elbow with fracture of the external condyle of the humerus. Conservative treatment was followed by resection of the joint and Carrel-Dakin treatment. The elbow ankylosed in a favorable position. The treatment in this case may be criticized in that the damaged soft tissues were not excised early and active mobilization was employed too late.

Case 3. Lacerated wound extending into the elbow-joint; severe sepsis. The joint was subsequently resected and the wound treated by the Carrel-Dakin method. Immobilization for five weeks was followed by active and passive motion with the pulley-weight machine. Full range of movement was re-established.

Case 4. Incised wound of the left hand with involvement of the extensor tendons of the index and middle fingers and compound dislocation of the metacarpophalangeal joint of the index finger. Resection of the wound edges was followed by suture of the tendons, joint capsule, and skin (primary suture). An excellent functional result was obtained.

Case 5. Incised wound of the dorsum of the hand by a piece of glass; tendons to index and middle finger severed; compound dislocation of the first metacarpophalangeal joint. All of the bruised tissue having been excised, the dislocation reduced, the capsule closed, and severed tendons united, the skin was closed. The result was healing by first intention and full motion of the fingers.

E. M. MILLER.

**Dujarier, C.: Pseudarthroses of the Humerus Consecutive to War Injuries.** *Med. Rec.*, 1919, xcvi, 323.

This analysis is based on a study of the author's 38 cases in which he distinguishes two groups, the closed pseudarthroses without loss of substance, and pseudarthroses following gunshot fractures with loss of substance. In the former the course is exactly analogous to that of simple fracture. This paper deals essentially with the pseudarthroses produced by projectiles, this second group being itself divided into two others depending upon whether loss of substance or suppuration is the predominating factor.

The author notes that adjacent articulations are often stiffened, but no true ankylosis resulted in his series. The muscles are always injured, either by destruction or by invasion of cicatricial tissue. Destruction of the brachial artery is rare but there is always a lesion of the nutrient artery of the bone. This may play an important rôle in the marked osteoporosis of fragments but it does not hinder the production of bony callus. The radial nerve is especially prone to trauma. In the author's series the ulnar and median nerves escaped severe injury. Division of the radial is a serious complication. Compression is common as the nerve may be caught in fibrous tissue passing between the fragments. Cutaneous lesions are important for they may interfere with the treatment. Depressed cicatrices which are adherent to deeper structures should be freed or excised.

In the operative treatment the author formerly waited for the completion of cicatrization in order to secure an aseptic field, but he now operates when fistulae are present. Even months after complete cicatrization the surgeon cannot be sure of an aseptic field and in addition there is muscular atrophy and perhaps ankylosis. Dujarier finds that very free drainage is followed by good results and usually firm consolidation.

Bone grafts are not often indicated in these cases even where there is considerable shortening (10 centimeters) because they do not aid in the functional result and although the grafting is successful the arm may remain weak and the prognosis may be doubtful.

Of five methods of surgical procedure, namely, plating, the use of silver wire, the use of the author's clamps, simple approximation without suture, and osteoperiosteal grafts, the author has employed plates and silver wire most frequently.

Suppuration is the great obstacle in the successful treatment of pseudarthroses, and drainage was necessary in nearly all of the cases reported. The author has abandoned the use of plaster casts and Delbet's apparatus. Instead he applies a large cotton dressing, immobilizing the arm parallel to the body and the forearm along the anterior surface of the thorax. With this method the wound may be exposed easily for dressings.

W. L. STRANBERG.

**Roberts, P. W.: Osteochondritis of the Hip.** *J. Orthop. Surg.*, 1919, i, 493.

Since his report in November, 1917, of two cases of osteochondritis of the hip, variously known as "Perthes' disease," "Legg's disease," and "quiet hip disease," the author has had eight more such cases. He is firmly convinced of the close relationship between this condition and syphilis. Often there is dental evidence of inherited syphilis. Emphasis is placed also upon the similarity between osteochondritis of the hip and the same process in the wrists, knees, and ankles.

Of the eight specimens of blood examined in the series reported, one gave a four plus, one a three plus,



two a two plus, three a one plus, and one a negative reaction. The family history was positive in two instances.

The impressive feature of these cases was the rapid recession of symptoms and the prompt increase in hip motion following the administration of mercury and potassium iodide. The eight cases are reported in detail.

PHILIP LEWIN.

**Bonnet, P.: Arthritis of the Knee-Joint.** *N. York M. J.*, 1919, cx, 239.

In this paper Bonnet considers the joint reactions complicating fractures of the tibia having a special anatomical type. The missile hits the bone some distance from the knee, and fissures starting from the focus of penetration extend along the tibial shaft to the articular surfaces. A reaction occurs in the joint, often ending in an infectious arthritis and modifying the clinical evolution so that a special line of treatment is indicated.

Fissure fractures involving the knee-joint are relatively infrequent, out of a total of 3,000 fracture cases collected during the war only 3 typical instances having been found. Joint wounds with fracture of the tibia are much more common. Among the fractures involving the tibia in its upper third, the fissures extend to the knee-joint in about 10 per cent. It is probable that the causation of a given anatomical type of fracture is governed by the nature of the missile and its size and momentum at the time of penetration, but precise data are wanting in this respect. It is the author's opinion that, all things considered, the size or velocity of the projectile has no distinct bearing on a given anatomical type of fracture. The anatomical make-up of the bone seems to him to be the principal reason for the formation of fissures extending to the joint.

In one of his cases the patient entered the hospital in the morning with a penetrating wound on the antero-external aspect of the leg. Amputation was done at once for symptoms of gas gangrene of toxic type but the patient died a few hours later.

The missile, the size of a pea, hit the tibia 5 centimeters below the articular interline, traveled through the spongy tissue, and spent itself against the compact posterior aspect of the bone, remaining embedded in the fissure. At the point of exit were two vertical fissures, one stopping exactly at the cartilage of conjunction. From the entrance orifice a long fissure started in a downward direction following the external aspect of the tibia. A second vertical fissure extended upward and split the articular cartilage of the glenoid cavity just in the region of the tibial spine.

It should be noted that posteriorly, where the epiphysis was not as yet united to the diaphysis, the fissure starting from the exit orifice stopped just at the cartilage of conjunction, while in front where bony union had taken place, the fissure extended freely along the epiphysis. This supports the opinion that the cartilage of conjunction plays an important part

in limiting the upward extension of the fissures by interrupting the anatomical continuity between the diaphysis and epiphysis, between the shaft and the crest. It would seem that the age of the subject enters into account in the anatomical shape of the fracture, and that fissure fractures involving the joint would be more common after the age of 18 years.

In three other instances the missile, which was the size of a bean, traveled through the bone and remained embedded just under the skin. The entrance wound was on the external aspect of the tibia, 4 centimeters below the articular interline. Two vertical fissures started off, one pointing downward to the extent of 12 centimeters and the other toward the articular surface which it did not attain. The exit wound, which was larger, was 2 centimeters below the interline at the antero-internal aspect of the bone and measured 20 centimeters in length. Two large fissures joined each other near the middle of the articular surface, breaking off a wedge-shaped piece in the external glenoid cavity. The fissure then continued onward through the tibial spine and external glenoid cavity.

In another series the missile entered on the internal surface of the left tibia 6 centimeters below the interline and struck the tibial plateau at the level of the external glenoid cavity, producing a vertical fissure in three fragments and splitting the joint surface in the form of a T. A second stellate fissure was produced on the joint surface of the external glenoid cavity.

In two of his cases the author was able to study the lesions of a confirmed arthritis and on the fresh specimen to verify the fissures as represented in the drawings of the dried preparations. The lesions were those of an ordinary infectious arthritis, but the joint surfaces had a blackish look, a gangrenous appearance with grayish fungous masses, an odor of infection, and thickening of the synovial membrane.

There are few clinical signs at first to indicate fissuring into the knee-joint in these common cases of fractures of the tibia from projectiles and it is only the arthritis which quickly develops that imparts a clinical peculiarity to such fractures. It is difficult to prove that these fissures into the joint may exist without producing arthritis.

Clinically, it seems legitimate to make the following distinction between the two types of fracture with joint complication. Early arthritis is symptomatic of broad fissuring and joint damage. The collection is usually infected from the beginning and the fracture undergoes the evolution of a joint fracture. Late arthritis is symptomatic of fine fissuring. The joint fluid is not absolutely infected from the beginning although secondary infection is bound to occur. This is the most perfect type of fracture with joint fissuring.

Every joint collection appearing immediately or within a few days in cases of fracture of the upper end of the tibia due to a missile, even when the latter has involved the bone some little distance from



the knee-joint, should be looked upon as symptomatic of fissuring into the joint and as bound to develop infection.

Once a suppurating arthritis of the knee has taken place, the gravity of these fractures, even after arthrotomy, is considerable. In early intra-articular collections the fracture focus must be sterilized by curettage of the pulpy mass of infected bone, the removal of the missile and other foreign bodies, and the use of ordinary antiseptics. The articular infection is to be dealt with by arthrotomy without delay. Resection of the knee is not indicated in such cases, removal of detached bone pieces in the joint alone being permissible.

When the joint collection appears late in the progress of the case and puncture shows that the blood contained in the joint is absolutely sterile on culture media, the fluid may be removed by puncture followed by washing of the joint with ether, but in all other circumstances arthrotomy must be done. Only too often, regardless of this treatment, a septicæmic state occurs and amputation at the thigh must be resorted to as a life saving measure.

G. W. HOCHREIN.

**Aloi, V.: Calcareous Infiltration of a Gouty Toe and an Extensive Thigh Scar** (Sull' infiltrazione calcarea d'un alluce gottoso e d'una cicatrice estesa della coscia). *Riforma med.*, 1919, xxxv, 414.

Aloi describes two clinical cases of calcareous infiltration. The first was that of a gouty patient 80 years of age who had an inflammatory process of the metatarsophalangeal joint of the right big toe. A sandy, calcareous detritus was expelled with the pus. The suppurative process continued in spite of vigorous disinfection. The toe was finally amputated.

The second case was that of a man aged 45 years who had been wounded in the thigh twenty-four years previously by a gun explosion. The scar of this wound, which showed intense calcareous infiltration, was resected.

The author's studies fully confirm the theory which attributes the pathogenesis of calcerous infiltration in particular to vascular change and necrosis of the tissues.

W. A. BRENNAN.

**Gill, A. B.: Dupuytren's Contracture with Description of Operation.** *Ann. Surg.*, 1919, lxx, 221.

The treatment of Dupuytren's contracture has long been tedious, difficult, and often unsuccessful. Even when temporary restoration of the hand has been secured, relapse has been common.

The author's experience in plastic surgery of the hand and forearm, though limited, has proved to him the great value of the free fat transplant in preventing adhesions after extensive dissections. It has demonstrated also the advantage of making incisions along the line of the natural creases of the hand and fingers in order to secure healing of the wound without danger of subsequent keloid growth,

contracture, and adhesion of the scar to underlying structures.

Gill employs the following method of operation for Dupuytren's contracture:

1. Under general anæsthesia, without the use of a tourniquet, a transverse incision is made along the distal palmar crease. Through this incision alone a careful dissection is made of the entire palmar fascia to or beyond the crease at the base of the thenar eminence, as far toward the base of the palm as is necessary, and to the web of the fingers. The skin is adherent to the fascia, and the dissection must be made carefully to avoid button-holing. With proper retraction as the dissection proceeds it is found that the entire fascia can be exposed and freed within the limits mentioned.

2. The contracted fascia is then excised without injury to the underlying tendons, vessels, and nerves. The tendons do not require lengthening as they do not participate in the contracture. If contracted fascia is present on the palmar aspect of the proximal phalanges, it may be excised through transverse incisions along the crease at the base of each finger involved. If now it is found that the proximal interphalangeal joint cannot be extended, or that it can be extended and flexed again only with a snap, the head of the first phalanx must be excised through a transverse dorsal incision over the skin.

3. A small free fat transplant from the thigh is inserted smoothly beneath the palmar skin. It will lie in position without sutures. It is placed here to prevent subsequent adhesion of the skin to the tendons and to reconstruct the normal softness and plumpness of the palm of the hand. The incision is closed with a few interrupted sutures of No. 0 chromic catgut. The hand is dressed on a well-padded splint for a week. Slight serous discharge may occur for a short time, probably due to some dissolution of the fat transplant. Infection from the outside may be prevented by the use of dichloramine-T on the wound at the daily dressings.

E. C. ROBITSHEK.

## SURGERY OF THE BONES, JOINTS, ETC.

**Freeman, L.: The Application of Extension to Overlapping Fractures.** *Ann. Surg.*, 1919, lxx, 231.

Freeman again reports his experience with external extension for fractures of the long bones and the superiority of his apparatus over the usual methods of external fixation. He states in regard to the open method of reduction and fixation: "At best it is often a complicated undertaking requiring prolonged anæsthesia, much experience, and a faultless technique—occasionally appearing to the patient as more formidable than the condition would seem to indicate."

The clamp used by the author, a modification of the Parkhill clamp, is more readily adjusted, can be placed with the screws at a distance from the break,



and gives more extension than the clamp of Parkhill or Keetley.

The screws are applied to the fragments, going through the medullary cavity, and should take a firm bite in the opposite side. Extension is then applied with a turnbuckle close to the skin and the clamp affixed. The after-care consists in daily dressings and the application of iodine to the screw perforations.

The advantages of this method are: (1) facility of application and absence of cumbersome apparatus; (2) effectiveness of the extension and exactness of its amount; (3) applicability in the presence of open wounds; (4) absence of strain upon articulations and joints; and (5) easy removal without an anæsthetic.

H. A. MCKNIGHT.

**Scal, J. C.: The Treatment of Joint, Bone, Nerve and Muscle Injuries by Mechanical Means.** *N. York M. J.*, 1919, cx, 195.

The most common injuries demanding early mechanical treatment are acute and chronic sprains, fractures, dislocations, and joint and nerve injuries. Acute sprains sometimes result in six to eight weeks of disability. In some joints a sprain may be complicated by the detachment of a spicule of bone that can be diagnosed by X-ray only.

Sprains will recover more rapidly if treated at once. Rest and cold applications for twenty-four hours should be followed by active and passive motion in the form of massage and exercise. The presence of pain indicates that treatment should be temporarily discontinued. Early motion tends to restore function to muscles and joints, reduce swelling and cedema, promote absorption, and prevent adhesions. A firm bandage over several layers of absorbent cotton will relieve swelling and promote absorption in from six to eight hours.

Sprain of muscles results from trauma or overwork. Limitation of motion should be obtained immediately, and should be followed by graduated contractions, light massage, and exercise.

The ideal method for the treatment of fractures is reduction under the control of the X-ray, proper splinting to maintain apposition, relief of the pain and cedema by early baking and massage, and the prevention of muscular weakness and adhesions by graduated contractions.

A Colles fracture should be lightly massaged in from three days to a week; if painful, two weeks after the injury.

When nerves are cut the joints should be kept free and the nutrition of the muscles maintained. In suturing a divided nerve it must be held in a position free from tension. The galvanic current (5 to 10 milliamperes) may be used to provoke muscular contractions.

An affected limb should be kept warm. For this purpose it may be immersed in hot running water or placed in an electric- or gas-baking apparatus as long as comfortable. A dry heat up to 400 degrees can be borne for twenty or thirty minutes.

The whirlpool bath is of service. Fixed joints and scarred tissue will become soft and relaxed, adhesions will break down, and function will be restored.

To be effective massage must be gentle and painless at first and applied each day. In chronic cases in which there is no pain, heavy kneading, stroking, pinching, and pounding movements should be employed.

An oily lubricant adds to the comfort of the patient and the ease of the operator. Treatment to re-educate and re-develop wasted muscles consists of exercises against resistance. Intra-articular adhesions in a shoulder-joint are shown by pain on any kind of manipulation. If the pain is free on any one movement, the adhesions are extra-articular. Limitation in all directions indicates arthritis and in such cases forcible breaking down under anæsthesia is indicated.

The expensive Zander apparatus may be replaced with the ordinary pulley and weight exercises.

Muscular wasting and muscular insufficiency are satisfactorily treated by graduated contractions.

J. J. KURLANDER.

**Lefèvre, H.: The Treatment of the Bone Cavities Resulting from Traumatic Osteomyelitis** (*Sur le traitement des cavités osseuses suite d'ostéomyélite traumatique*). *Rev. de chir.*, Par., 1919, lvii, 140.

Filling an osteomyelitic bone cavity with fat or other tissue which has been completely separated from its vascular connections gives good results in only exceptional cases. However carefully the cavity is disinfected it always remains more or less septic and the graft becomes infected and is eliminated.

The result is quite different, however, when the soft parts in the vicinity of the cavity—fat, periosteum, or muscle—are utilized and cut in such a way that when invaginated they are left attached to their origin by a pedicle which keeps them alive.

According to the author's method the fistulous tract is resected and the bone cavity surgically cleared and carefully tamponed with gauze to assure hæmostasis. The skin is then widely freed on the two edges of the incision and all fibrous tissue carefully excised. A fatty muscular, periosteal, or mixed strip is then cut in the nearby tissues so that its pedicle will be contiguous to the edge of the cavity to be filled. The gauze tampon is then removed and the living graft turned over on its pedicle, invaginated into the cavity so as to fill it completely, and fixed in its new position with catgut sutures. A muscle strip appears to be the best. It failed only once in 23 cases, whereas in 19 fat grafts there were 3 failures. In this method of grafting, the soft parts and the skin are sutured but it is well to leave a drain at the lower angle of the wound for forty-eight hours.

For a cavity in the humerus the author generally uses a graft of muscle removed from the deltoid, the anterior brachial, or the triceps muscle. For a cavity in the femoral diaphysis the graft is removed from the quadriceps muscle. In the case of the tibia only periosteal



grafts are used, and for the sacrum and ilium a fat graft from neighboring areas.

This method is especially applicable to the humeral and femoral diaphyses, the trochanter, sacrum, and ilium, and the upper epiphysis of the tibia. In other bones invagination of a graft is seldom possible.

The method described is best suited to recent and only slightly infected cavities with hard walls. Poor results are obtained when there is a soft, reddish, and raw osteitis.

In old cavities the walls of which are much involved by caries or in recent cavities which are still much infected, treatment in two stages is indicated. In the first stage the cavity should be widely cleaned out, the wound left open, subjected to intermittent irrigation with magnesium chloride or salt solution, and treated by heliotherapy. The second stage is reached when the cavity appears clinically in good condition. It is then again curetted and immediately filled as described. The sterilization of the cavity is easily controlled by bacteriological examinations. W. A. BRENNAN.

**Teece, L. G.: Tendon Transplantation for Dorsal Interosseous Paralysis.** *Med. J. Australia*, 1919, ii, 131.

The author describes an operation he performed in a case of a wound in the region of the neck of the radius which had resulted in complete destruction of the dorsal interosseous nerve. The disability consisted in loss of power to extend the fingers at the metacarpophalangeal joints and to abduct or extend the thumb. The patient was unable to open his grip.

The technique of the operation was as follows: A 2.5-centimeter incision was made at the level of the wrist-joint and the flexor carpi radialis and its tendon as well as that of the palmaris longus were divided as low down as possible. A 5-centimeter incision was then made at the juncture of the middle and upper thirds of the forearm over the bellies of these muscles and the muscles were pulled up out of the incision and wrapped with moist gauze. This having been done, a U-shaped incision with its convexity downward was made over the dorsum of the wrist-joint and a large flap dissected up. The subcutaneous tissues were tunneled through with a blunt dissector from the back of the wrist to the upper of the two volar incisions. The flexor carpi radialis and palmaris longus tendons were then pulled down through this tunnel and made to appear on the dorsum of the wrist. The tendons of the extensor brevis and abductor longus pollicis were divided and inserted into a longitudinal slit in the tendons of both radial extensors of the wrist where they were sutured under considerable tension with chromic catgut. From this moment until the final application of the splint, one assistant devoted his entire attention to holding the wrist and fingers fully extended and the thumb abducted and extended. The surface of the tendons of the common extensors of the fingers was roughened and the tendon of the flexor carpi radialis split into two layers. One layer was then passed over the dorsal surface and the other over the volar

surface to the common extensors and there sutured firmly. The palmaris longus was similarly inserted into the extensor longus pollicis. The flexor carpi ulnaris was inserted into the extensor carpi ulnaris. After the wound was closed a "cock-up" splint was applied. Eleven weeks after operation the result was perfect. PHILIP LEWIN.

**Gunn, J. A., and Gallie, W. E.: Report on Cinematic Amputations Based on a Visit to Putti's Military Clinic in Bologna, Italy.** *Canadian M. Ass. J.*, 1919, ix, 694.

Dalatala and San Giorgi have had great success in cinematic amputations of the forearm. The operative technique consists in closure of the flaps between loops of tendons. As soon as healing is complete the patient practices contracting the muscle against resistance. Maximum power is developed within six weeks. After four weeks a temporary artificial hand is supplied which he uses until the permanent hand is finished. This consists of a light socket and a jointed wooden hand fastened to the forearm by a perfectly fitting vulcanite-covered metal ring placed just above the condyles. The fingers are connected by means of a strong cord with a rod which rests in a tunnel through the tendon and so responds to contractions of the muscles. A light spring causes the fingers to open moderately when the contraction ceases.

The most popular operation appears to be the one in which the flexors only are used, although a satisfactory result was obtained with the extensors. As an example of the efficiency of this method of amputation one soldier who had lost both hands was able to take a cigarette case and a box of matches from his pocket, put a cigarette into his mouth, take out a match, and light the cigarette. The power to rotate the hand is preserved whenever the pronator teres is intact unless there is fusion at the lower end of the forearm, in which case the first step in the operation is mobilization of the ankylosis. Any irregularities of the stump which retain movement and power, such as a portion of the carpal ones, are utilized as motors to communicate movement to the fingers. E. M. MILLER.

**Gallie, W. E.: Observations on the Lengthening of Amputation Stumps.** *Lancet*, 1919, cxcvii, 282.

The author states that amputations in which the femur is sectioned less than 3 inches below the lesser trochanter make most unsatisfactory stumps to fit with artificial legs and in this article describes a case in which a short stump was successfully lengthened.

The operation was performed in the Canadian General Hospital at Buxton, England. The patient was admitted April 15, 1918, with a discharging sinus following an amputation of the thigh at about the juncture of the upper and middle thirds. On May 3, the terminal inch which consisted of necrotic bone was removed, leaving only  $2\frac{3}{4}$  inches of stump below the lesser trochanter. The wound



was closed without drainage and healed in two months.

An artificial limb was tried but the stump was so short that when the thigh was flexed the bone slipped forward over the top of the socket. The choice then lay between fitting a tilting table leg and lengthening the femur. On February 27, 1919, the flaps were again reflected back, the bone exposed as high as the greater trochanter, and  $3\frac{1}{2}$  inches of the shaft of the bone cut free with an osteotome. This piece of bone was then slid downward so as to lengthen the femur  $2\frac{1}{2}$  inches and fastened with two beef bone screws. The flaps were dissected up sufficiently so that it was possible to draw them down and close them over the end of the bone. The wound healed by primary union, the fragments were solidly united in two months, and the patient is now wearing an artificial limb.

Gallie suggests that more adequate fixation, such as converting the screws into bolts by using nuts made of beef bone might be a safer procedure. He mentions also silver wire, brass ribbon, and metal bolts but prefers beef bone because it unites rapidly with living bone and undergoes absorption and replacement. When the stump is too short and when it is not wise to obtain a graft from the other leg, the material required might be obtained from a recently amputated leg.

In transplantation of bone from another patient or from a recently amputated limb it might be well to make sure that the cells of the one patient are capable of living in the lymph of the other as indicated by testing their bloods for hæmolysis and agglutination.

The operation described was performed six months ago. New bone has restored the shaft where the graft was removed to its normal thickness and has also increased the thickness of the graft itself.

The author concludes his article by suggesting that as it seems possible to lengthen bone successfully in amputations, the skin flaps should be left very long when subsequent operation is anticipated so that later sufficient skin will be available to cover the graft properly.

R. B. MARTIN.

**Bradford, E. H.: Ambulatory Treatment of Fracture of the Femoral Neck.** *Boston M. & S. J.*, 1919, clxxxi, 10.

The work of the orthopedic surgeon has now a broader scope than formerly. On account of his training and experience in dealing with non-operative details as well as his operative skill, he is able to assist other branches of medicine. He has given precision to the methods for the operative treatment of club-foot and rachitic deformities which are now easily and definitely curable by any properly trained general surgeon. He has added to the medical understanding of paralytic affections and given scientific basis for the successful management of tuberculous bone and joint diseases.

Illustrative of what may be done by the methods of the orthopedic surgeon the following case is cited:

A woman, 64 years old, fell while working and fractured the neck of her femur, Feb. 18, 1918. The clinical diagnosis was confirmed by the X-ray. Instead of plaster or a bed weight-extension apparatus it was decided to employ the traction abduction appliance formerly used in the treatment of hip disease. This appliance is a perineal ring crutch with a traction attachment and an abduction arm which presses upon the side of the perineum opposite the fracture. Its advantages are that it furnishes more fixation at the hip than can be obtained by a plaster spica, provides practical abduction without pressure, and allows painless change of position in bed and early locomotion on crutches.

By the use of this splint the patient made a remarkably satisfactory recovery. February 28, or ten days after injury, she was able to sit up in bed. March 7 she spent part of the day on a couch. March 12 she moved about the room in a crutch walking-frame and soon changed to crutches. April 15 all traction was removed. On April 30 the splint was removed for short periods at night, the length of these periods being increased until May 18, when the splint was discarded entirely. The patient resumed work in the autumn, three months after the injury, and has now practically no shortening and no discomfort or limp.

Two other cases in which good results were obtained are also cited.

M. H. HOBART.

**Corlette, C. E.: Three New Amputations of the Foot, Each Conserving the Calcaneal Tread.** *Med. J. Australia*, 1919, i, 8, 479, 502, 526.

The operations reported are outlined briefly as follows:

#### OPERATION NUMBER I

1. Make incision.
2. Disarticulate at the mediotarsal joint.
3. Cut off the lower part of the head of the talus, with the slope a little backward and upward.
4. Cut away the sustentaculum tali.
5. Cut down the upper part of the anterior projection of the greater process.
6. Remove the interosseous ligament. Cut the lateral, medial, and posterior talocalcaneal ligaments, and the calcaneofibular band of the lateral ligament of the ankle. Separate the soft parts from the sides and upper part of the calcaneus. Cut short useless tendons.
7. Continue the plane of section on the lower aspect of the talus backward and upward until a plane cut surface remains and the whole articular surface is removed.
8. Shave down the upper aspect of the calcaneus until a plane surface with an upward and backward slope is produced, suitable for fitting beneath a similar surface on the talus.
9. Push the calcaneus forward till it projects about 2 centimeters in front of the head of the talus and adjust it to fit there neatly.
10. Bore holes from side to side through the neck of the talus and through the calcaneus in such a posi-



tion that a wire ligature passed through the holes and tightened will hold both firmly in their destined position, relative to one another.

11. Trim the flaps, but leave the anterior tendons long enough to suture to the base of the lower flap.

12. Remove the tourniquet and attend to hæmostasis.

13. Wire the bones tightly together with stout wire (1 to 2 millimeters).

14. Trim away any excessive projection of bone (greater process of the calcaneus).

15 and 16. Suture the tendons and close the wound.

#### OPERATION NUMBER 2

1. Make incision and disarticulate at the mediotarsal joint.

2. Cut off the sustentaculum tali.

3. Remove the talus.

4. Separate the soft tissues from the side and upper part of the calcaneus. Shorten the tendons. Cut away the remains of the anterior ligament of the ankle-joint from the lip of the lower extremity of the tibia, and clear away the soft tissues from the surface and borders of each malleolus.

5. Cut away the prominent upper anterior projection of the greater process of the calcaneus.

6. Cut the plane surface on the upper aspect of the calcaneus with the slope upward and backward; cut until a good breadth of cut reaches well backward. It is usually best to reach as far as the smooth portion of the posterior surface.

7. Cut a plane horizontal surface on the distal extremity of the tibia between the two malleoli.

8. Shear off half the downward-projecting length of the lateral malleolus. Then thin it and bevel it to reduce its bulk. Conserve the articular face on its deep aspect.

9. Drill each malleolus in a transverse direction.

10. Make a trial fitting of the calcaneus to the under aspect of the tibia between the malleoli, the calcaneus to be slid forward in a well-advanced position. Make a drill hole across the calcaneus in such a position that a wire ligature passed through it and through the malleoli on either side will hold the calcaneus up into position against the tibia between the malleoli when drawn taut.

11. Attend to hæmostasis.

12. Wire up tight with 1 millimeter silver wire. Tendon may be substituted.

13. Trim away any projecting bone.

14. Close the wound.

#### OPERATION NUMBER 3

1. Make skin incision and amputate through the mediotarsal joint.

2. Remove the sustentaculum tali.

3. Remove the talus.

4. Remove a slice of the distal extremity of the tibia and the lateral malleolus as in Syme's operation but with an osteotome.

5. Remove the upward projection of the greater process, and then shave down the calcaneus to form a plane surface with a slope upward and backward. Cut away any surplus lengths of useless tendons.

6. Push forward the calcaneal remnant into a well-advanced position after attending to hæmostasis, and fix it there by a 2-millimeter wire ligature passed through boreholes made from side to side through the tibia and the calcaneus. Cut back any excessive projection of the calcaneus.

7. After final trimming of flaps, etc., where necessary, and complete hæmostasis, suture up the wound.

K. L. VEHE.

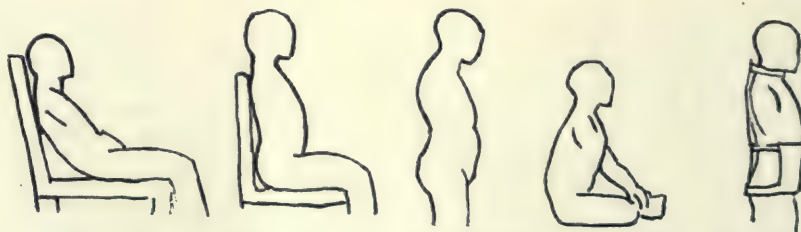
#### ORTHOPEDICS IN GENERAL

**Bradford, E. H.:** *The Treatment of Round Shoulders.* *Boston M. & S. J.*, 1919, clxxxi, 30.

Round shoulders, a form of curvature of the spine, is a chronic affection which should have the careful thought and consideration of the orthopedic surgeon. It is due chiefly to abnormal conditions such as faulty posture with resultant strain on inadequate muscles and ligaments.

It is important to know when children are threatened with an increase of these curves and what abnormal conditions should be removed. The average child spends six to eight of his twelve or more waking hours in ill-fitted chairs. Faulty clothing and imperfect hygiene must also be taken into consideration as well as the lack of sufficient healthy exercise out-of-doors.

After studying the individual case, corrective treatment should be undertaken as demanded.



Figs. 1, 2, and 3: Faulty chair attitude and weakened back. Fig. 4: Floor-sitting correcting hollow-back attitude. Fig. 5: Check-rein brace.

(Bradford, E. H. : *The Treatment of Round Shoulders*)



Exercises to strengthen weak muscles are important and so simple that as a rule they can be performed daily at home. These should always be adapted to the given case. Usually it is the long muscles of the back and neck which require treatment but occasionally the glutei, the abdominal muscles, and those attaching the scapulæ to the trunk must be strengthened. Free exercises or exercises with simple apparatus such as dumb bells and ordinary weight and pulley machines are adequate. Chest expansion is obtained by running at play and deep breathing exercises. Creeping is good for sagging backs.

Daily recumbency to break the long-continued back strain is beneficial. For this there should be placed on the bed a reclining board which should be long enough to reach from the head to below the buttocks, sloped sufficiently to support most of the weight of the head, and sufficiently narrow to allow free play of the shoulders.

The ideal treatment for children with weakened backs is active varied exercise with short intervals of recumbency.

The improvement is always slow and very gradual. Careful examination and notes of progress are essential. In the back of a normal child there should be no space between the spine and the floor, except at the neck, when he lies flat with the thigh flexed. The chest should be well rounded and the shoulders should touch the floor.

Certain cases of increasing curves demand some form of spinal support which should be directed toward preventing the head from stooping forward, the chest from flattening, and the dorsolumbar spine from bending forward. Such a check-rein brace can be made from two crossed pieces of flat steeling fastened against the back and shoulder blades by straps around the neck, shoulders, and abdomen.

The treatment is necessarily tedious, but need not be burdensome.

M. H. HOBART.

**Perera, A.: The Methods of Choice in the Treatment of Flatfoot** (Tratamientos de elección en el pie plano). *Med. Ibera*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 54.

No one method of treatment is applicable to all cases of flatfoot for the various types are of diverse etiology and pathologic anatomy. In general, the slow, progressive, and gentle procedures are most valuable. Violent measures, such as forced straightening under anæsthesia and maintenance of the reduction by immovable bandages, should be discarded.

In congenital flatfoot, adjustment and fixation are indicated, the latter obtained by bandages or other means. In traumatic flatfoot good braces should be used. In rachitic flatfoot the natural tendency is toward a cure but in the meantime the foot should be massaged and suitable shoes should be worn. For paralytic flatfoot tendon transplantation in some instances, arthrodesis, massage, and electrical treatment are recommended. For flatfoot with static valgus, not fixed, massage, gymnastics, and progressively corrective shoes should be prescribed. In other cases massage of the muscles of the leg, electrical treatment, and shortening of the tendons may be necessary. If the flatfoot is contractural, the treatment should consist of rest, the application of fomentations, careful motion, massage, and the use of corrective shoes, or better, the application of bandages with the foot in slightly modified position without the use of anæsthesia. Occasionally tenotomy may be necessary. In cases of flatfoot with bony deformity, cuneiform resection, and, if there is extreme valgus, tibial osteotomy may be indicated.

Each case must be studied carefully. Before treatment is begun and during its course roentgenograms should be made in order to decide what changes may be necessary.

M. M. MATTHIES.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Hertzberg, H.: Fracture and Dislocation of the Dorsal Spine and Complete Rupture of the Cord.** *N. York. M. J.*, 1919, cix, 1028.

The case reported is that of a man, aged 26, who received a fracture and dislocation of the spine with rupture of the cord from a backward fall of 20 feet from the roof of a building onto a rock pile.

Shock treatment was instituted, rendering the patient in condition for operation nine hours after entering the hospital. Exposure revealed fractures of the ninth and tenth dorsal vertebræ, parts of which were driven into the spinal canal. Both spinous processes were broken off at their junction with the laminae. The fracture line ran vertically through the center of the tenth vertebra, splitting it into halves. The entire spine below the ninth vertebra was driven forward so that the under surface of the eighth was palpable. The articular processes were

not fractured, but the capsular ligaments on both sides were torn away completely. The spinal canal was empty except for a blood clot and some glistening tissue along the anterior wall.

Traction was exerted on the feet by a pulley and counter-extension maintained by a strap placed around the patient's chest, the ends passing under his arms and crossing at the occiput. Sufficient traction was exerted so that the impaction at the site of the fracture could be freed, and by manual manipulation a perfect reposition was obtained. Backward flexion of the chest maintained by a sandbag was necessary to retain the articular processes in apposition with their respective articular facets.

Examination of the spinal canal revealed a glistening structure at the front, which proved to be the cord greatly attenuated as it had been stretched out at the time of fracture. The wound was closed with-



out drainage. The patient was placed upon a previously prepared frame over which canvas had been tightly stretched. Slits were cut in the canvas, outlining the patient's body, and through these the entire trunk from pelvis to forehead was encased in plaster.

A severe cystitis soon developed despite careful catheterization and irrigation every six hours day and night. Six months later the patient voided voluntarily for the first time since the accident.

Two weeks after the operation pus was noticed oozing from the lower edge of the cast. A window having been cut in the cast, the pus was found to be coming from a gangrenous spot over the sacrum.

When subjected to pressure, even if only for a short period, the tissues over all the bony prominences became gangrenous. The whole of the posterior bony wall of the sacrum and the entire coccyx died and had to be removed. Both heels also broke down, necessitating removal with a goodly portion of each os calcaneum.

The temperature was septic and the bowels moved involuntarily, frequently, and almost continuously. The sloughs were cut out as rapidly as demarcation was evident. The wounds were dressed with balsam of Peru and kept clean with benzine. The latter proved very efficacious in that it removed all broken-down fat, pus, and secretion from the wound and was non-toxic.

By the end of the fifth month the wounds had cleaned up and granulated sufficiently to warrant removing the cast. The operation wound had healed by first intention, the spine was in perfect line and apposition, and apparently firm, bony union had taken place. There was no improvement in the paralysis, however, and owing to contractures about the joints it was not possible to flex the hips or the knees.

To leave the patient in bed meant death from inanition and septic absorption in a short time. A ladder was therefore fixed above the entire length of his bed, just high enough to enable him to reach it with his hands. Five months later he was able to pull himself up through the ladder, stand upon his feet, and balance himself. This improved his general condition immensely. An apparatus in the form of a baby's safety chair was then constructed to make him an ambulatory patient. This consisted of an iron framework on rollers with a bicycle saddle seat suspended on three straps, but as there was no back rest it did not meet the requirements. Moreover, the pressure of the saddle on the tissues overlying the tuber ischii caused them to slough and this confined the patient to his bed for another month. The balancing exercises were continued during this time.

A new frame was then constructed which furnished support for the back. With this and fixation of the legs by hip braces the patient was soon able to propel himself about the ward. His general condition improved and he regained his balance to such a degree that in four months he was able to walk the entire length of the ward with but slight support. After much assurance and persuasion he attempted walking with crutches. The hip braces were discarded and split plaster casts applied to each leg. These permitted the use of shoes but the latter caused sloughing of the big toes. Tennis shoes, however, eliminated this trouble, and the patient was soon able to go about unattended. He was able to go upstairs by sitting on one step and raising his body to the next with his arms.

While he is now absolutely paralyzed with practically complete anæsthesia below the lumbar region, nevertheless he can again become partially, if not totally, self-supporting. P. H. KREUSCHER.

## SURGERY OF THE NERVOUS SYSTEM

**Blanc y Fortacin: Nerve Stretching in the Treatment of Trophic and Inflammatory Processes**  
(La elongación nerviosa en el tratamiento de los procesos tróficos e inflamatorios). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y ciruj., 49.

The stretching of nerves in trophic processes has been employed with success in cases of incipient gangrene of the toes, perforating ulcer, and vascular disturbances of the angiospasmotic type not dependent upon any compressing lesion of an artery or vein.

Blanc y Fortacin has used this method on thick nerve trunks, the sciatic and popliteal nerves, for lesions of the leg and foot, the regions chiefly affected.

Stretching of a nerve provokes immediate vasodilation due to paralysis of the sympathetic fibers within the nerve, this vasodilation being manifested by increased heat in the extremity and elevation of the arterial tension as measured by the oscillometer.

The immediate effects consist in a diminution of pain and an increase in the color of the base of the trophic ulcer or of the tissue outlining the area threatened with gangrene. The process is contraindicated, however, in cases of septic gangrene with or without emphysema. In cases of dry gangrene stretching of the nerves restores vitality to the tissues near the focus and thereby makes possible a lower amputation.

This favorable change in the circulation of the extremity was demonstrated by the author in many cases by the reaction of Moskovicz and in his opinion is due undoubtedly to the development of the collateral circulation resulting from the vasodilation.

In various cases the author was able by this means to avoid amputation, in one instance an amputation of the knee, and in another, an amputation of the tibiotarsal joint. In all cases there were observed: (1) a decrease in the swelling; (2) the



initiation of movements without pain; (3) a decrease in the suppuration in open lesions; and (4) an increase in heat and blood pressure.

M. M. MATTHIES.

**Pollock, L. J.: Peripheral Nerve Injuries, with Especial Reference to Lesions of the Brachial Plexus.** *Surg. Clin. Chicago*, 1919, iii, 849.

The author presented 7 cases at his clinic for the purpose of demonstrating some of the types of lesions of the brachial plexus.

Cases with involvement of the musculospiral or radial nerve show three distinct primary symptoms pathognomonic of this condition: (1) wrist-drop; (2) inability to extend the first phalanges of the fingers; and (3) inability to extend the thumb.

Ulnar palsy is characterized also by three primary clinical symptoms: (1) weakness or paralysis of the adductor pollicis, demonstrated by inability to grasp a flat object firmly between the thumb and forefinger of the affected hand without using the flexor or the thumb; (2) clawing produced by the over-action of the extensors of the fingers; and (3) inability to flex the little finger with the terminal phalanges extended.

Paralysis of the median nerve is characterized by the three following clinical facts: (1) inability to oppose the thumb to the little finger; (2) inability to flex the terminal phalanges of the thumb; and (3) inability to flex the index finger.

Combined lesions of the ulnar and median nerves produce the ape-like hand.

One of the interesting observations in lesions of the brachial plexus is the coincidence of a lesion of the spinal cord with these injuries. Emphasis is placed upon the necessity for careful observation of the patients before and after operation, in regard to both the motor and the sensory function.

E. C. ROBITSHEK.

**Lewis, D.: Peripheral Nerve Surgery.** *Surg. Clin. Chicago*, 1919, iii, 769.

The author presents five cases of nerve injury treated at his clinic, giving in each instance the history and the findings at the time of the operation. In the first case, the musculospiral nerve was found to be compressed by a very delicate piece of connective tissue which reduced its diameter almost one half. In the second case, a distinct neuroma was discovered at the distal end of the proximal segment of the external popliteal nerve. In the third case, the ulnar and median nerves were bound down in scar tissue. The median nerve he injected with 60 per cent alcohol. In the fourth case, spindle-like enlargements of both median and ulnar nerves were found as well as scar tissue at the site of injury. In the fifth case, there was a distinct neuroma of the external popliteal nerve. After the scar tissue was resected in this instance, a long defect remained and as it was impossible to unite the ends of the nerves nerve transplantation was attempted.

In all nerve surgery, pinching of the nerve or any

undue roughness should be avoided. If a diagnosis of complete anatomical or physiological interruption is made, an operation should be performed. When there is anatomical interruption end-to-end suture is the only operation which gives any assurance of a high percentage of recoveries. Nerve grafting should be performed when end-to-end suture cannot be done. Neurolysis is an operation which the author believes should be performed often. Muscle neurolysis is preferable to any other type. Emphasis is placed upon the necessity for careful and diligent after-treatment in these cases. E. C. ROBITSHEK.

**Adson, A. W.: A Clinical Study of Nerve Anastomosis.** *Ann. Surg.*, 1919, lxx, 157.

A brief review of the history of nerve anastomosis details of the etiology of the conditions requiring such treatment, the histology of nerve regeneration, the different operations and their results are given with the end-results of 41 cases of nerve anastomosis having a postoperative record of sixteen months or more.

In discussing the operative procedures the author emphasizes three distinct conditions which may be found and their treatment:

1. Neuromata on both ends of a severed nerve, the larger being on the proximal end. These must be resected before anastomosis is attempted.

2. Trauma to the nerve with the development of interstitial neuritis and pseudoneuromata. This condition suggests neurolysis if the function is 50 per cent or more; otherwise, resection and end-to-end anastomosis should be done.

3. Constriction of the nerve in scar tissue or callus which, with regard to resection, is treated as are cases of trauma.

The operation of choice is end-to-end anastomosis effected without tension and with fine sutures of silk. If the operator is compelled to leave a gap between the sutured ends, it should be less than 3 centimeters and may be bridged with autogenous transplants of sensory fibers or by fascial tubulization. If the gap measures more than 5 centimeters, tendon transplantation or arthrodesis is advised.

It is emphasized that regeneration occurs quite successfully during the first year, but that the amount of regeneration diminishes as time elapses between the date of the injury and that of the repair, the results being only fair after the second year and very rarely successful after the fifth.

The average amount of return of function in the 41 cases reported is 62 per cent. Seventy-three per cent of the patients operated upon showed improvement. In 17 per cent of the cases the operation was a total failure and in 10 per cent gave indefinite results.

**Coriat, I. H.: A New Sign of Nerve Regeneration.** *Boston M. & S. J.*, 1919, clxxi, 163.

The author directs attention to a new and important sign of nerve regeneration, namely, formica-



tion and tingling produced by pressure. He believes that formication occurs usually at about the fourth or sixth week and indicates the presence of young axis-cylinders in the process of active regeneration. Coriat quotes Tinel's description of this test. He believes that it is very easily applied, but should be carefully done in each case as the tingling produced by neuroma formation may lead to error.

In neuroma formation or in the early stages of regeneration without neuroma formation, the formication is limited to the level of the lesion. In neuroma formation also, when the regenerating axis-cylinders are blocked and may consequently lose themselves in the surrounding tissues, the formication remains fixed at the level of the lesion. In actual regeneration of the nerve the formication progresses over the zone of the growth of the axis-

cylinders and may be detected finally along a part or all of the cutaneous distribution of the nerve. However, while for a time it may involve the entire cutaneous distribution, it may be detected finally only in the extreme periphery as regeneration becomes complete.

The exact cause of this formication is difficult to state, but since it can be produced by a far lighter pressure than formication in an uninjured nerve, it is probably due to an increased sensitiveness of the young axis-cylinders. However, it is best not to rely upon the formication sign alone. The test should be carefully correlated with the findings of other investigations of the nerve lesion, such as those to determine the protopathic and epicritic sensibility, regeneration pain points, and electrical reactions.

E. C. ROBITSHEK.

## MISCELLANEOUS

### BLOOD

**Corachan Garcia and Gallart Mones: A Study of the Coagulation of the Blood as a Factor in Surgical Prognosis** (El estudio de la coagulación sanguínea como dato pronóstico en cirugía). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y ciruj., 52.

The authors use Bloch's method of determining the coefficient of coagulation of the blood.

Under the conditions of their test the citrated blood is very similar to the fluid blood in the blood vessels.

In blood which coagulates normally, coagulation begins in the tube when the ratio of sodium citrate to calcium chloride is as 1 is to 2. When the ratio is as 1 is to 1 the clot is complete.

Calcium chloride greatly increases the coagulation index.

The appearance of postoperative hæmatomata in patients with a coagulation index below normal is an observed fact.

A low coagulation index may be brought up to normal before operation by treatment with calcium chloride and gelatine.

Patients with venous thrombosis have a normal coagulation index. Thrombosis does not depend upon a high coagulation index alone but also upon other concurrent cases, one of which usually is infection.

M. M. MATTHIES.

**Lundsgaard, C.: Studies of Oxygen in the Venous Blood. V. Determinations on Patients with Anæmia.** *J. Exper. M.*, 1919, xxx, 147.

In the first four articles of this series facts were discussed which indicate that the oxygen content of the venous blood depends on a number of factors: (1) the total oxygen-combining power or the hæmoglobin content of the blood; (2) the degree of oxygen saturation of the blood in the lungs; (3) variations in the metabolism of the tissues drained

by the vein tapped as compared with the metabolism of the rest of the body; (4) variations in the rate of blood flow through the tissues drained compared with the rest of the body; and (5) variations in the minute volume of the heart.

In order to find the effect of one of these factors on the oxygen content of the venous blood, it is necessary to control the other factors or keep them constant.

This paper deals with a study of the venous oxygen content and unsaturation in a series of patients in whom the hæmoglobin varied over a wide range.

Nine patients with anæmia and one patient with polycythæmia were selected for this purpose. The hæmoglobin in these cases varied from 181 to 27 per cent. The oxygen-combining power of the blood varied consequently from 33.40 to 5.00 volumes per cent. The lungs, which were examined before each determination, did not show any pathologic changes which might influence the saturation of the blood. The blood samples were drawn at least two hours after a meal and after ten minutes of rest. Apart from a slight increase in the pulse rate in some of the patients there was no sign to indicate any abnormality in the circulation. The diuresis and the blood pressure were normal.

The technique in drawing the blood samples was exactly the same as that described in the first article of this series. In determining the oxygen of the venous blood Van Slyke's method was used. The total oxygen-combining power of the blood was either determined directly—Van Slyke's method—or calculated from the hæmoglobin determined by Haldane's method.

The results of these experiments are summarized as follows:

1. Determinations of the oxygen content and the oxygen unsaturation of the venous blood were made in the cases of patients who had varying amounts of hæmoglobin.



2. The oxygen unsaturation of the venous blood is independent of the oxygen capacity unless the latter is reduced below the normal value for oxygen unsaturation (about 5 volumes per cent). In a polycythæmic patient with 33.4 volumes per cent oxygen capacity (181 per cent hæmoglobin), for example, the venous oxygen content was 28 volumes per cent, giving an unsaturation of 5.4 volumes per cent. Similarly, in an anæmic patient with only 6.7 volumes per cent oxygen capacity (36 per cent hæmoglobin), the venous oxygen was 1.5, giving an unsaturation of 5.2 volumes per cent. This means that the tissues extract from the blood all the oxygen they need with apparently equal readiness, regardless of whether the extraction leaves a great oxygen reserve in the blood as in polycythæmia, or practically no reserve as in anæmia.

3. The results seem to show that the resting organism does not increase its circulation until all the reserve oxygen is used. This means that the resting anæmic organism does not need or use any compensation for its anæmia until the hæmoglobin has sunk below 30 per cent. Below that value the organism increases the blood flow in order to secure for the tissues the normal amount of oxygen.

G. E. BEILBY.

#### BLOOD AND LYMPH VESSELS

**Anderson, W.:** *Contusion of the Arteries. Brit. J. Surg.*, 1919, vii, 95.

As a probable cause of secondary hæmorrhage or aneurism contusion of the arteries is of considerable importance. Anderson reports 10 cases treated by himself at casualty clearing stations, all of which were seen within twelve hours after the patients had been hit.

Not until 1917 did he suspect a primary, although not obvious, injury to the artery in cases in which at operation the vein was found to be divided and the artery intact and which later developed severe secondary hæmorrhage. Later in such cases he discovered that the wall of the artery was bruised, and the pulsation distal to this was a transmitted pulsation. Suspecting an embolus, he opened the artery and found a rupture of the internal and middle coats of the vessel for about two-thirds of its circumference and only the smallest amount of clot at the edges of the curled-up coats.

The possible causes as suggested by Sencert are: (1) direct shock; (2) indirect shock; and (3) overstretching of the vessel. In two of Anderson's cases the outer sheath covering the artery and vein was not penetrated but showed slight bruising. He calls attention to the following points of interest:

1. The velocity of the missile. In all of the cases except one there were entrance and exit wounds.

2. In all instances the artery lay between the track of the missile and a bone.

3. The injury of the vessel was always on the side nearest the track.

According to Sencert there are three degrees to the

condition: (1) when the internal coat only is affected, showing fine striated lines; (2) when these lines penetrate into the middle coat; and (3) when the internal and middle coats are ruptured in a circular direction around the entire circumference of the vessel. All of Anderson's cases were of the second group. The external appearance showed a characteristic bruising of the vessel wall and a slight bulging toward the track of the missile. In three cases in which there was distinct but diminished pulsation below the site of injury he opened the artery at the primary operation and found only shreds of blood clot in the vicinity of the torn coat. In others opened five to eight days after injury a firm clot was discovered occluding the vessel. After washing off the clot the appearance of the artery was the same as in the first three cases, viz., a rough, thinned-out, irregular area on the side nearest the wound track made up of tunica adventitia only and bounded by the curled-up edges of the tunica media and intima.

In the diagnosis the site of the wound, the diminution or absence of a distal pulse, and the appearance of bruising of the wall or sheath of the vessel should arouse suspicion of contusion.

At first the author opened the artery with the idea of removing the clot and re-establishing the circulation, but later gave up this procedure for the following reasons: (1) there is no clot at this state; (2) it is impossible to suture or to trim the edges of the torn tunica satisfactorily; (3) suture of the tunica adventitia alone is difficult and unsatisfactory; (4) the lumen of the vessel is narrowed and the chances of rapid clotting are increased rather than decreased.

If there is the faintest pulsation below the injury it is better to leave well enough alone and tie the vessel above and below the injury on the fourth, fifth, or sixth day. In the larger vessels Tuffier tubes or venous grafts are recommended. In the smaller vessels ligation above and below the injury four to six days later is advocated. This delay lessens the risk of gangrene, and before this date secondary hæmorrhage is not apt to occur. The author emphasizes the importance of recognizing and treating the type of injury described in order to prevent secondary hæmorrhage.

J. DE J. PEMBERTON.

**Walker, C., and Walker, L.:** *Sudden Detachment of the Aortic Intima (So-Called Dissecting Aneurism). Brit. M. J.*, 1919, ii, 200.

The author reports an unusual case of sudden detachment of the aorta in a man 65 years of age. The patient, who was apparently in good health, suddenly fell and temporarily lost consciousness. On reviving he complained of severe substernal pain and paresis of the left leg. Physically his appearance indicated severe hæmorrhage. General examination revealed little of diagnostic import. There was some paresis of the left leg, but the reflexes and knee-jerks were normal. The cardiac impulse could not be felt. The heart sounds were faint, but otherwise normal. The pulse was rapid, small, and very weak. Some improvement in the paresis of the leg and the character



of the heart beat followed the administration of nitrites but death ensued suddenly in thirty-eight hours.

The postmortem examination revealed extensive atheromatous changes in the aorta and the greater part of the aortic intima lying free in the lumen. The ascending aorta showed a pouch-like dilatation. In the thoracic aorta the intima in part retained its lumen, but in the abdominal aorta and iliac arteries it was completely detached. There were extensive sclerotic changes also in other organs and vessels.

In discussing the mechanism of the production of dissecting aneurism the authors comment on the extreme rarity of the condition. They state that the necessary precursors of such an aneurism are (1) profound atheromatous change, and (2) a break in the intima. The break in the intima may be produced in three ways: (1) an atheromatous patch may destroy the wall of a vas vasorum; (2) it may break down and form an atheromatous ulcer; and (3) the intima may split. These splits are usually found in the ascending aorta or arch and probably occur as a result of stretching of the aorta when the intima has become relatively brittle as a result of atheromatous change. The splits of themselves are an insufficient explanation of stripping because breaks in the aortic intima are far more frequent than aortic dissecting aneurism. In the opinion of the authors the motion of the blood stream rather than the blood pressure is an important factor in the production of dissecting aneurism. While the total kinetic energy of the blood current is not great at any given point, nevertheless in the presence of a break in the intima the constant recurrence of 2 centimeter-grams four thousand times per hour is capable of producing in time appreciable mechanical results. A flap of the detached intima may be thrown across the lumen, forming a dam, so that all of the kinetic energy is directed to stripping the intima. The blood pressure within the intima would fall to zero while the pressure outside the stripped portion would rapidly rise toward ventricular systolic pressure.

W. J. TUCKER.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

MacCarty, W. C., and Broders, A. C.: *The Rôle of the Pathologist in the Practice of Medicine.* *J. Lab. & Clin. Med.*, 1919, iv, 687.

As pathology is a comparatively new science, it is only beginning to be thought of as more than an interesting luxury, a confirmer of diagnosis after the patient is dead.

In the early history of medicine, clinicians knew all that was known of pathologic conditions and processes simply because so little was known about them. Today both the pathologist and clinician have more than they can do. Scientific efficiency can be obtained only by the development of co-operative specialism by these two important members of the medical profession.

The authors submit the statistics compiled in the examination of 49,083 patients. In all, 157,848 laboratory reports were made. Such reports are of value for the following reasons:

1. They confirm the diagnosis which may be only suspected clinically. For example, microscopic examination may confirm the suspicion of malignancy of an ulcer of the stomach

2. They actually make the diagnosis when there are no clinical diagnostic symptoms. The clinician obtains a history of a gastric lesion which appears on exploration to be an extensive carcinoma. The microscopic examination shows that the gastric lymphatic glands are inflamed.

3. They recognize accessory pathologic conditions. The clinical diagnosis of myomata of the uterus may be followed by hysterectomy with the findings of a cornual carcinoma.

4. They correct the clinical diagnosis. An ulcer of the lip removed for epithelioma may be found to be syphilitic.

5. They confirm the positive clinical diagnosis. The clinician makes a diagnosis of endocarditis and streptococci are found floating in the blood. A diagnosis of uterine malignancy is made and the scrapings reveal a carcinomatous polyp.

6. They determine the degree of the process of the disease. A patient has a pathologic kidney and the degree of function is determined by the phenolphthalein and blood-urea tests.

7. They determine the patient's physical status preparatory to possible operation. In hyperthyroidism the determination of the metabolic rate indicates whether the patient is a good surgical risk.

8. They help to determine the extent of the operation. The method of removing a breast nodule depends entirely on the findings of the microscopic examination.

9. They give data for the pre-operative, operative, and postoperative prognosis. A patient has a slowly developing enlargement of the tibia with an enlarged inguinal gland. If the Wassermann is negative, the inguinal gland must be sectioned.

10. They determine the cause of death. Autopsy frequently clears up an obscure cause of death.

11. They determine the causes of death due to false operative judgment. Patients are sometimes advised to submit to operations and die because of the presence of other pathologic conditions which are recognized only at autopsy.

12. They determine the causes of death due to faulty operative technique, such as the unintentional ligation of ureters or important intestinal blood vessels.

13. They assist in determining the causes and methods of surgical infection. Routine bacteriological examinations of operative wounds, operative materials, etc., lead to better control over possible infection.

14. They assist in clinical, surgical, and laboratory research.

C. D. HOLMES.



**Kettle, E. H.:** *On Polymorphism of the Malignant Epithelial Cell.* *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Path., 1.

The adoption of modern experimental methods has so revolutionized the study of malignant disease that it is now possible to carry out extensive investigations without paying more than the most superficial attention to the microscopic structure of tumors. Nevertheless all cancer research must ultimately rest on a histological basis. In the clinical laboratory, where the available material cannot be submitted to experimental conditions, the fundamental importance of histology is unchallenged.

The pathologist must depend mainly upon the microscope to distinguish between benign and malignant growths, and should he desire to pursue broader aims than those that are purely utilitarian, his work is still practically restricted to histology. This line of research, however, is far from being exhausted. In classification alone much remains to be done in the way of separating the true neoplasms from those blastomatoid conditions which so much resemble them and give rise to so much confusion in our conceptions of tumor formation. Moreover, by a careful consideration of their microscopic structure, it is possible to discover a great deal about the biological properties of tumors and the influences they exercise upon the healthy tissues in which they grow. Finally, it is of the greatest importance to correlate the results of experimental research with human pathology and for fruitful results along these lines, it is essential that the work should rest upon a sure foundation of wide and accurate histological knowledge.

Of more interest are those instances of multiple tumors occurring in the same organ when the growths are in actual contact with one another. In such cases there is always the possibility that the presence of one of them may have been the factor determining the genesis of the others.

On reading some of the reports of multiple and mixed tumors it appears that a suspiciously high proportion of such tumors have occurred in the thyroid gland and the uterus in which organs they are notoriously prone to present unusual features. Many of the writers appear to have a limited conception of the morphology of the malignant cell and though they have hastened to accept and apply to their own material the research on sarcoma production of the experimental laboratories, they have paid little attention to other observations which have demonstrated the extreme powers of polymorphic growth possessed by the malignant epithelial cell. When it is possible to study the growth of such tumors experimentally, doubtful points may be cleared up and satisfactory conclusions arrived at, but with human material this is, as yet, not practicable. The tumor is seen in only one phase of its growth, and interpretation of what is seen may be impossible.

Under these circumstances it must be realized that conclusions drawn from the study of tumors in man

should be much more critically examined before they are accepted than those arrived at from the study of experimental tumors which can be observed under conditions enormously more favorable.

In the last twelve years a large number of tumors have passed through the author's hands, including many possessing quite unusual features. From the complexity of their structure, some of these would usually be regarded as mixed tumors. There is, however, another and more reasonable possibility that they were instances of extreme polymorphic growth of carcinomata. Absolute proof is, of course, impossible to obtain in the absence of any method which would make it possible to study their behavior on prolonged transplantation, but there is no doubt that this interpretation is correct. In any case it is most important to make allowance for the morphological elasticity of the epithelial cell in interpreting any anomalous growth. Failure to do this leads only to erroneous conclusions, and if the study of cancer in man is to help at all in the solution of the problem as a whole, the facts upon which our theories are based must be beyond criticism.

The tumors selected to illustrate these points lend themselves to analysis fairly well, and though it is impossible to convey the impression formed from the study of many series of sections by a few figures, the salient points are clearly possible.

G. E. BEILBY.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Adamson, R. S.:** *Cultural Characters of Certain Anaerobic Bacteria Isolated from War Wounds.* *J. Path. & Bacteriol.*, 1919, xxii, 345.

Of the strictly anaerobic organisms *bacillus tetani* is not discussed in detail in this article. As this organism presents many features of interest and requires special technique for its isolation, it will be reported separately. A summary of its cultural characters, however, is given in the general table at the end of the article.

The article is based upon a study of 51 cases treated in detail and about 10 others which were examined for special purposes. All the patients were soldiers in the second Western General Hospital in Manchester. The organisms described are those actually isolated from such cases, though to render the report more complete a number of bacteria isolated from other sources have also been included.

Beside the examination of wound material, a preliminary study of other substances was undertaken with the object of discovering the sources of infection. For this purpose samples of garden and pasture soil were examined; also a number of specimens of human feces and one specimen of horse feces. In addition, a preliminary study was made of putrefying meat from which a number of proteolytic anaerobes were isolated.

As the nomenclature of the anaerobic group of bacteria is somewhat confused, the identification of



organisms by the published descriptions was frequently difficult.

The practice adopted was to utilize a well-established name when identification was possible, even at the sacrifice of the strict rules of priority. However, in a group in which the boundary lines constituting a species are so uncertain, the strict rule applied to other groups need not, perhaps, be insisted upon. Several of the organisms described were left without specific names, but designated simply by a symbol, thus following the practice of McIntosh and others which seemed to the author preferable to coining further names in discussing a subject already overloaded with synonyms and ill-defined and uncertain species.

A good deal of the confusion regarding these organisms seems to have arisen from the tendency to lay too much stress on a limited number of features. The form of colony produced on agar has generally been regarded as a chief factor of diagnosis, but in many cases this has been found exceedingly variable for one and the same species. Certain species undoubtedly do form very distinct types of colony, but in many others this feature will not help identification. Again, the microscopic appearance has been relied upon very largely, but especially among the proteolytic group of anaerobes the various organisms are so unfamiliar that it is exceedingly difficult to distinguish them in a mixed film. Also the size and spore-production differ very considerably according to the medium employed.

The experience gained has led the author to the view that for diagnosis a considerable range of cultural characters is necessary, and that the fermentation, both of carbohydrates and proteins, must be considered.

The author summarizes his article as follows:

Fifteen organisms were studied and their cultural characters described. Of these, 13 were spore-producing bacilli, 1 a non-sporing bacillus, and 1, a diplococcus. The spore-producing bacilli fall into groups based on their cultural reactions. The first group, consisting of *Bacillus oedematis maligni*, the central spore bacillus, *Bacillus bifermentans sporogenes*, and *Bacillus tetanoides*, may be designated the "proteolytic group." All the organisms digest egg and liquefy gelatin and serum more or less completely. They also digest milk without the production of acid and show a greater or less power to digest meat. Their action upon carbohydrates, however, is very slight. *Bacillus tetani* is classed in this group though its proteolytic action is not vigorous.

A second or saccharolytic group comprises *Bacillus aerogenes capsulatus*, *Bacillus butyricus*, *Bacillus septique*, *Bacillus von Hibler IX*, and *Bacillus E*. This group exhibit a marked power of fermenting sugars. They render milk acid and are all gas producers. They have little or no action upon egg or serum. *Bacillus septique* alone liquefies gelatin. The members of this group render meat and brain medium more or less acid.

A third group, which contains *tetanoides*, *Bacillus L*, *Bacillus S*, and McIntosh's bacillus Type III, is characterized by negative rather than positive characteristics. The organisms composing it possess neither proteolytic nor saccharolytic powers. *Bacillus L* approaches the proteolytic group in its action upon milk and liquefaction of gelatin. In its cultural reactions McIntosh's bacillus Type III also approaches the first group in the absence of any power to ferment carbohydrates, in its reaction upon milk, and in its slight action upon egg. On the other hand, it appears morphologically to be so much allied to *Bacillus von Hibler IX* that at present it is placed in the intermediate position.

G. E. BEILBY.

**Wolf, C. G. L.: The Biochemistry of Pathogenic Anaerobes. VI. The Proteolytic Action of *Bacillus Sporogenes* (Metchnikoff) and *Bacillus Welchii*. *J. Path. & Bacteriol.*, 1919, xxii, 270.**

The investigation reported was to determine the variation which might take place in the fermentation of cooked meats, using well-defined strains of *Bacillus welchii* and *Bacillus sporogenes*. The concentrations of protein were varied. Some of the experiments were made with rapid sampling and therefore were of short duration. In the short experiments the object was to obtain information regarding the initial stages of the fermentation. In all of the experiments the medium used was cooked meat.

The conclusions reached from these experiments were as follows:

In a medium consisting solely of sterilized muscle and water, both *Bacillus sporogenes* and *Bacillus welchii* grow with great rapidity. Both form large quantities of gas consisting of carbon dioxide and hydrogen. The amount of gas formed per liter of medium is apparently about equal with both organisms. With *Bacillus sporogenes* about 70 to 75 per cent of the gas consists of carbon dioxide.

Analyses of the gas from fermentations with *Bacillus welchii* show a much smaller percentage of carbon dioxide, roughly about 38 per cent. The proteolytic power of *Bacillus sporogenes* is very great, as much as 477 milligrams of ammonia-nitrogen having been found in the filtrate from a fermentation while in the same liquid there were 237 milligrams of amino-acid nitrogen.

With the large amount of gas formed by *Bacillus welchii* there is relatively little proteolysis. The chemical results thus confirm what is observed in cultures of *Bacillus welchii*, namely, that the particles of meat do not tend to lose their original contour.

A fact of great interest in a comparison of the two organisms is the difference in their volatile-acid production. *Bacillus welchii* which produces large quantities of volatile acids in carbohydrate-containing media, such as milk or glucose peptone, does not form any considerable quantity of acid with muscle tissue. On the other hand *Bacillus*



sporogenes is capable of forming acids in quantity in any medium, whether it contains carbohydrates or not.

G. E. BEILBY.

**Dandy, W. E.: Experimental Hydrocephalus.**  
*Ann. Surg.*, 1919, lxx, 129.

The production of all types of hydrocephalus by precise experimental methods finally lifts the idiopathic veil and reveals hydrocephalus as a disease with a clearly defined etiology and pathology. The first evidence that hydrocephalus could be produced experimentally was incorporated in an article written with Blackfan in 1913. It was demonstrated that when a tiny obstructing body was introduced into the aqueduct of Sylvius of a dog, all the cerebral ventricles proximal to the occlusion became dilated; distally, the size of the fourth ventricle was not changed.

The following year Thomas published additional experimental evidence showing that hydrocephalus is caused by obstruction. Following the injection of aleuronat granules into the lateral ventricles, the iter became plugged; organization of the granules resulted in total occlusion of the opening and resultant hydrocephalus.

The experiments reported in this article were conducted on dogs under ether anesthesia. The mid-portion of the squamous occipital bone, including the posterior margin of the foramen magnum, was removed with rongeurs and the dura opened in stellate fashion. Gently elevating the cerebellum, the roof of the fourth ventricle was exposed and perforated, and a small piece of cotton cautiously pushed forward on the point of a fine, graduated carrier. It was passed over the medulla and pons until it glided into the aqueduct of Sylvius, where it was deposited by withdrawing the carrier. An improved technique for this procedure consists in enclosing the cotton in an oiled gelatin capsule which soon dissolves in the cerebrospinal fluid.

The aqueduct of Sylvius can be recognized fairly easily by the sense of touch in the finger which is directing the entry of the obstruction, its entrance being denoted by the constriction at the terminus of the funnel-like approach from the wide fourth ventricle. Moreover, the iter is at a constant measured distance from the posterior border of the cerebellum. If the head is not held in a strictly median position, however, it is easily possible to make a false passage into the contiguous soft brain tissue with permanent injury to the pyramidal tract and the nuclei of the cranial nerves.

By producing hydrocephalus with a tiny obstruction in the aqueduct of Sylvius, the etiological rôle of an occlusion is absolutely established. Being a single precise process and involving no neighboring structures, other possible explanations of the resultant hydrocephalus are precluded. When an obstruction is present in any part of the ventricular system, the ventricles always dilate anterior to the occlusion. Following occlusion of the aqueduct of Sylvius, therefore, the third ventricle and both

lateral ventricles become distended. The size of the fourth ventricle remains unchanged.

Sections of the brain of a dog one month after the obstruction was introduced showed that doubtless for some time after the cotton was placed in the iter there was only a partial occlusion which became complete with organization of the foreign body. In these experiments the animals became lethargic and there was intermittent vomiting. Ventricular dilation was accompanied by a corresponding degree of cerebral destruction. The experiments were all performed on dogs after union of the sutures of the skull so that enlargement of the head could not occur. In animals operated upon at birth or soon thereafter the characteristic hydrocephalic enlargement of the head will necessarily be an outstanding feature which cannot be duplicated when the animal is older.

From this series of experiments there is absolute evidence that: (1) cerebrospinal fluid forms in the cerebral ventricles; (2) the absorption of fluid in the ventricles is at least less than the production; (3) the aqueduct of Sylvius is a necessary outlet from the third and both lateral ventricles; and (4) there are no collateral channels which assume the function of the iter when it is occluded.

The conclusions drawn from the experiments reported are:

1. Hydrocephalus has been produced by placing an obstruction in the aqueduct of Sylvius. Dilation of the third and both lateral ventricles results.

2. One foramen of Monro was occluded; this was followed by a unilateral hydrocephalus.

3. If the choroid plexus of one lateral ventricle is completely removed at the time the foramen of Monro is occluded, dilation does not occur and the entire lateral ventricle collapses.

4. This is the only absolute proof that the cerebrospinal fluid is formed from the choroid plexus. At the same time it proves that the ependyma does not secrete cerebrospinal fluid.

5. If the choroid plexus of both lateral ventricles is removed and an obstruction is placed in the aqueduct of Sylvius, hydrocephalus still results in the third and both lateral ventricles, but at a reduced rate. The fluid forms from the choroid plexus of the third ventricle but cannot escape into the subarachnoid space.

6. Cerebrospinal fluid forms in all the cerebral ventricles and is absorbed almost entirely in the subarachnoid space. The sole communication between the ventricular system and the subarachnoid space is through the foramina of Luschka and the median foramen of Magendie.

7. The phenolsulphonephthalein test will prove conclusively whether the foramina of Luschka and Magendie are open or closed. Closure of these foramina invariably causes hydrocephalus.

8. Hydrocephalus follows ligation of the vena magna Galeni if the ligature is placed at the origin of this vein. Ligatures beyond or in the sinus rectus



have no effect because there is sufficient collateral venous circulation.

9. The communicating type of hydrocephalus has been produced in dogs by a perimesencephalic band of gauze saturated in an irritant which induces adhesions. This obstruction prevents cerebrospinal fluid from reaching the cerebral subarachnoid space where most of the cerebrospinal fluid is absorbed. The resultant diminished absorption of fluid results from hydrocephalus.

10. Hydrocephalus follows ligation of the great vein of Galen because of an overproduction of cerebrospinal fluid. In other types of hydrocephalus, both obstructive and communicating, the accumulation of fluid is due to a diminished absorption of cerebrospinal fluid. G. E. BEILBY.

**Weed, L. H., and Wegforth, P.: Experimental Irrigation of the Subarachnoid Space. *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 317.**

The extremely high mortality attending pyogenic infections of the meninges by organisms other than the diplococcus intracellularis and the prospects of a marked incidence of meningitis among the casualties of war, suggested that investigations be directed toward the treatment of such infections.

In addition to the extreme virulence of these pyogenic organisms within the meninges of man the difficulties in the treatment of meningitis have been due to the lack of specific sera and the technical obstacles to be overcome in reaching the organs involved. So far, therapeutic measures have been applied along two main lines. The first of these is credited to Leonard Hill who wrote: "Finally it is suggested that in such a pathologic condition as meningitis, irrigation of the meninges might be employed. The operation could be as easily and safely carried out as that of irrigation of the peritoneum." The other therapeutic procedure, advocated by Franca, Wolff, and others, involves freeing the canal of as much pus as possible by lavage, followed by injections of bactericidal chemicals into the subarachnoid space. As yet neither of these methods has been attended by great success, but until more specific therapy is available, it appears that treatment must depend upon the improvement and modification of these general measures.

The animals used in the experiments reported were adult cats. These were anesthetized with ether, either by the intratracheal method or by cone, and the usual precautions were taken to prevent operative infection. In the earlier experiments the irrigation was limited to the spinal canal. For this, the first puncture needle was inserted into the subarachnoid space through the occipito-atlantoid ligament, and the second in the lumbar region, either through the lumbosacral ligament or between the fourth and fifth lumbar vertebrae. Between the needles it was possible to pass fluid through the spinal subarachnoid space in either direction, though as a rule the descending route (from cervical to lumbar) was selected. Later, in order to include

the cerebral meninges in the irrigation, needles were introduced into the subarachnoid space in the vertex area; from there the flow could be conducted either to a needle inserted through the occipito-atlantoid ligament (resulting in a cerebral irrigation) or to a lumbar needle (washing out the entire subarachnoid space).

The conclusions based upon the results of these experiments were as follows:

1. Irrigations of the spinal and cerebral subarachnoid spaces are well tolerated by cats if the irrigating fluid is composed of sodium chloride, potassium chloride, and calcium chloride in proper proportions (modified Ringer's solution). If, however, the irrigation is done with isotonic solutions of sodium chloride alone, various toxic effects become apparent. Many of these animals die during or immediately after the irrigation. If this immediate toxicity is survived, convulsive seizures and acute mania are almost invariable. Recovery from such attacks is frequent.

2. Single irrigation of infected meningeal spaces with modified Ringer's solution prolonged the life of the animals as compared with controls. The period of survival in many cases was doubled as a result of this washing-out of the infected meninges.

G. E. BEILBY.

**Slye, M., Holmes, H. F., and Wells, H. G.: Primary Spontaneous Tumors of the Testicle and Seminal Vesicle in Mice and Other Animals. XII. Studies in the Incidence and Inheritability of Spontaneous Tumors in Mice. *J. Cancer Research*, 1919, iv, 207.**

Tumors of the testicle would seem to be uncommon in mice for it has been difficult to find even a single case reported in the literature although they have been described in other species of lower animals. Thus, among 103 primary tumors observed by McCoy among 100,000 rats killed in plague work, there was only one described as an "angiosarcoma" of the testicle and no further detail was given.

Carcinomata of the testicles, which are common in horses and dogs, form sometimes soft and sometimes hard tumors in which not rarely single portions are differently formed. Through mucoid and colloid degeneration of the cell-nests, cysts with gelatinous contents may result.

Infiltration along the spermatic cord and lymph-node metastases are observed frequently. Horses especially appear to develop testicular tumors, particularly if we consider the relatively small number of old animals that have not been castrated. In Japan where this operation is performed less often than in Europe, equine testicular tumors are most abundant. Thus Kimura records the finding of 49 such growths among 142 tumors observed in 77,224 horses that were slaughtered. This may be compared with the figures in the census statistics on the mortality from cancer in the registration area of the United States which show that of 52,420 cases of malignant tumor only 121 were



recorded as arising in the testicles (2.3 per thousand). As 21,282 of the cancer cases were those of males, the portion of testicle tumors is 5.8 per thousand of all tumors in males. Kimura studied in detail 12 specimens of equine "orchidoblastomata" varying in weight up to 7,500 grams. All were unilateral and in at least 5 cases there were metastases in the spermatic cord and the inguinal and lumbar lymph-nodes.

The authors summarize their work as follows:

Among 19,000 mice which died natural deaths and about one-half of which were males, there were 28 primary tumors of the testicle. Most of these resembled in all essential features the tumors that arise in the testicle of man and other animals, consisting of cells very similar to the epithelium of the seminiferous tubules arranged in an alveolar structure. Despite great vascularity and a markedly atypical structure, no remote metastasis was observed, although in one case a series of six contiguous independent nodules was formed, and one had bilateral testicular tumors. Two of the growths, one of which arose at the site of a wound, seemed to be true spindle-cell sarcomata. Three of the typical "orchidoblastomata" also followed trauma. No evidence could be obtained that any of these tumors had arisen in a teratomatous growth and no cases of teratoma were observed.

One case of polymorphous-cell sarcoma of the seminal vesicles of a mouse is described, apparently the second case of a tumor of this organ in a lower animal that has been reported.

Two cases of primary spontaneous tumor of the testicle in dogs are also described.

With the exception of one sarcoma, all of the 28 neoplasms of the mouse testis occurred in the members of a single strain of mice and its hybrid derivatives, thus substantiating the statement that heredity influences the incidence of tumor development in different organs or tissues. This fact probably explains also the lack of any recorded cases of tumor of the testis in mice from other laboratories.

G. E. BEILBY.

**Hinman, F.: Experimental Hydronephrosis—Repair Following Ureterocystoneostomy in White Rats with Complete Ureteral Obstruction.** *J. Urol.*, 1919, iii, 147.

White rats are particularly adaptable to experimental work on hydronephrosis. Hydro-ureterocystoneostomy may be done successfully on these animals and permits the study of the anatomical and functional repair following the removal of a complete ureteral obstruction.

The anatomical changes that follow complete ureteral obstruction are characterized by intra- and extrapelvic dilatation with an associated pressure-atrophy of the parenchyma. Tubular changes are characterized by dilatation, collapse, and atrophy, which, given in the order of severity, involve first the lateral, then the polar, and finally the median sagittal portions.

The collecting tubules show the earliest and most marked dilatation, while the convoluted tubules dilate least, but undergo collapse and atrophy the earliest. The glomeruli are surprisingly resistant to the compression. Intravital stain demonstrates functional insufficiency of the lateral portions of the kidney as early as seven days, and this is quite noticeable in two weeks. In hydronephrosis which has continued for forty-five days or longer intravital staining is not possible.

Infection hastens hydronephrotic atrophy. The effect of relieving the back pressure in hydronephrosis which has continued from twenty-one to sixty days is a decrease in size with preservation of the shape of the kidney and the grouping of all tubular remnants in one relatively large median sagittal lobule. The tubular and glomerular elements show definite hypertrophic changes. In hydronephrosis which has continued for ninety-five days or longer no such central lobule is observed. The central lobule developed after relief of obstruction in hydronephrosis which has continued up to sixty days shows many hypertrophic convoluted tubules which stain intensely by the intravital method. MAX KAHN.

**Stewart, G. N., and Rogoff, J. M.: The Action of Drugs on the Output of Epinephrin from the Adrenals. II. Concentrated Salt Solutions (Sodium Carbonate) Injected into the Circulation.** *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 167.

The authors' attention was accidentally drawn to the action upon the epinephrin output of small quantities of concentrated salt solutions introduced directly into the circulation of cats. Sodium carbonate solution (half to three-quarters saturated) was used in the tube connecting the carotid with the mercurial manometer. Determinations were being made of the epinephrin output under conditions in which a considerable fall of blood pressure was apt to occur some time after the collection of the specimens of the adrenal blood on which the normal or initial epinephrin output was estimated. As in occasional experiments the authors were puzzled to find that one or more of the subsequent adrenal specimens had epinephrin concentrations so much out of line with the usual rule that the concentration is inversely proportional to the blood flow, it was necessary to assume that the rate of epinephrin liberation had undergone an abrupt and decided change. This had not occurred in a long series of experiments made under other conditions in which blood-pressure tracings were not necessary. On looking into the matter it was observed that when anomalous behavior of the epinephrin output occurred the fall of blood pressure was speedily followed by an abrupt rise associated with evidence of excitation of the central motor mechanisms (increased reflex excitability and convulsions and changes in the respiration). It is known that the intravenous injection of concentrated salt solutions lead to such symptoms. Therefore it seemed fairly clear that small quantities



of the carbonate solution passing back from the manometer connection into the artery must have been responsible not only for the motor and vasomotor excitation, but also for the changes in the epinephrin output, presumably through an action on the central nervous mechanism which governs it.

While it is not possible from this experiment to determine whether an increased liberation of epinephrin from the one adrenal remaining took any sensible share in the great rise of blood pressure, it was shown clearly by injecting carbonate after removal of the second adrenal that a good rise of pressure was obtained in the absence of epinephrin liberation. Naturally the absolute amount of the rise was less than after the previous injection as the condition of the animal, of course, had deteriorated. Experiments on strychnine indicate that even the greater and much more sustained increase in epinephrin output produced by that drug can play but a minor rôle in the increase of arterial pressure.

The authors summarize their conclusions as follows:

1. Intravascular injection of small volumes of concentrated salt solutions (sodium carbonate) causes a temporary increase in the rate of liberation of epinephrin from the adrenals.

2. This increase is presumably due to stimulation of the nervous mechanism which governs the epinephrin output since it is accompanied by symptoms of a general excitation of the bulbospinal centers and is not obtained, or obtained only in a minor degree, when even larger quantities of the carbonate are injected in more dilute form.

3. In experiments upon the epinephrin output it is not advisable to use concentrated solutions of salts in tubes connecting an artery with a mercurial manometer.

G. E. BEILBY.

**Stewart, G. N., and Rogoff, J. M.: The Action of Drugs on the Output of Epinephrin from the Adrenals. III. Nicotine.** *J. Pharmacol. & Exper. Therap.*, 1919, xiii, 183.

Of the few statements in the literature as to the action of nicotine upon the output of epinephrin, none, so far as the authors are aware, contains any quantitative data. Nor are any of them based upon a method capable of yielding direct and unequivocal qualitative evidence. The best investigation was that of Dale and Laidlaw but in this it was observed merely that certain reactions which are elicited by nicotine on the non-pregnant uterus of the cat and in the eye after removal of the superior cervical ganglion are modified when the experiment is made under such conditions that epinephrin can no longer reach these structures from the adrenals. The difference is explained by the hypothesis that the nicotine action is due in part to a stimulation of the adrenals resulting in an increased liberation of epinephrin.

The authors believe that, as has been set forth in another paper on the action of strychnine upon the epinephrin output, indirect evidence of this kind

is valuable when it corroborates the results of more direct methods, but that, standing alone, it must be interpreted with great care. For example, it would not be possible in these experiments to know whether as a consequence of the action of the drug on the circulation a larger amount of epinephrin per minute or a greater concentration of it might not be supplied to the uterus or the eye without any previous change whatever in the rate of discharge. It is scarcely necessary to add that even if such observations indicate a stimulating effect of nicotine upon the epinephrin output, they do not afford the means of measuring the amount of increase.

These remarks are not intended as a criticism of such interesting and suggestive experiments, but merely to point out the limitations of such indirect methods.

The writers summarize their observations as follows:

1. The predominant and by far the most durable action of nicotine upon the epinephrin output, whether it is administered intravenously or hypodermically, is a depressant or paralyzing action. The maximum diminution of the epinephrin output is reached rather rapidly and is followed by more gradual recovery which, when the dose is not too large, proceeds until approximately the original output is attained. At the time of maximum depression no epinephrin at all may be detected in the blood of the adrenal vein by the test objects chiefly employed (rabbit intestine and uterus segments).

2. The depressant action is preceded by a transient stage of excitation which in the experiments reported lasted as a rule not longer than from half a minute or less to a minute. In this state the rate of epinephrin output is markedly increased (from two or three to ten or fifteen times the original output or even more, under the experimental conditions reported).

3. The latent period of the transient excitation with intravenous injection of the drug is very short. In some of the experiments there was evidence that it could not have exceeded a few seconds.

4. The brief stage of excitation passes rather abruptly into the much more lasting stage of depression. The maximum increase in the rate of epinephrin output is followed at a relatively short interval by the maximum depression of the rate. After the latter, gradual recovery begins.

5. The changes in the rate of epinephrin output are roughly parallel to the changes in the blood pressure caused by nicotine. This fact indicates that when the sympathetic ganglion cells on the efferent vasomotor path are being stimulated or depressed, a corresponding stimulation or depression is being exerted on the efferent adrenal secretory path.

6. It may be pointed out that the effect of nicotine upon the epinephrin output is, generally speaking, the converse of the effect of strychnine. The predominant action of strychnine is a marked and long-lasting augmentation of the epinephrin output. There are indications that the strychnine stimula-



tion of the output may be preceded by a brief depression. The nicotine action develops more suddenly than that of strychnine, as might be expected from the fact that the point of attack of nicotine is the efferent path while that of strychnine is the central mechanism.

7. The transient augmentation of the epinephrin output by nicotine may be associated with an increase in the concentration of epinephrin in the blood of the adrenal vein much beyond the maximum observed with the lowest blood flows in animals simply anesthetized (with ether, morphine, or urethane). The strychnine augmentation of the output has not been found to be associated with any increase in the normal maximum concentration (something like 1:500,000 in the serum of adrenal blood assayed with rabbit segments).

8. Confirmatory evidence of the conclusions deduced from assays of the adrenal blood on rabbit intestine and uterus segments has been obtained by a method of auto-assay (the collection of adrenal blood for a given time in a cava pocket and the study of the blood pressure reactions elicited when the blood is released from the pocket into the circulation) and by other methods.

9. In the one experiment the epinephrin store of the adrenals was not found to be altered by nicotine.

G. E. BEILBY.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Bastos Ansart and Aspeitia Esteban: Roentgenography of Bone Atrophy and Its Diagnostic and Prognostic Significance** (La radiografía de las atrofías óseas y su significación diagnóstica y pronóstica). *Med. Ibero*, 1919, Número extraordinario, I Cong. nac. de med. y ciruj., 112.

In some affections of the bones and joints the presence, appearance, and course, or the absence of bone atrophy constitutes a diagnostic and prognostic sign of the greatest importance.

On the basis of the appearance, form, and character of this atrophy the authors believe two types may be distinguished: one, in which the rarefaction affects the body of the bone or articulation uniformly, and the other, in which the lack of opacity appears to be unequal, irregular, and in patches. In many affections, however, these types are not well marked.

In the roentgenogram tuberculosis of the joint is revealed from its very beginning by a greater or less degree of bone atrophy, usually of the diffuse type. The presence of this atrophy is so constant that its absence suffices to exclude the diagnosis of joint tuberculosis.

Tuberculosis of the body of the bone also gives rise to atrophy but less constantly and not so early. When a synovial membrane is affected by the tuberculous process, however, even though it be at a distance, the atrophy will appear wide spread through all the bones that form the joint.

During long periods of tuberculous osteo-arthritis

atrophy may be the only disturbance demonstrable by roentgenography. In the further evolution of the disease there may be added to the atrophy the roentgenographic signs of various bone lesions. In such case, the atrophy changes its diagnostic import to a prognostic import in the sense that when it persists or increases along with the focal lesions the prognosis remains grave, but if it recedes in spite of these lesions, the prognosis may be considered favorable.

The disappearance of the atrophy is the first roentgenographic sign of the cure of the process. As long as atrophy can be demonstrated in the affected articulation by comparison with the normal side, tuberculous osteo-arthritis cannot be considered cured even though clinically it appears to be cured.

In some forms of articular tuberculosis, particularly those that are severe, the rapidly progressive atrophy is revealed by an intense trabecular resorption respecting apparently certain bundles of transverse trabeculae which appear in the roentgenogram as parallel rays. In the authors' opinion therefore, the presence of these rays should be interpreted as indicating a poor prognosis.

The treatment of articular tuberculosis by immobilization and drainage exaggerates the atrophy, adding the effects of the inactivity to those of the tuberculous process itself, but this is so variable and inconstant that it does not require consideration when the diagnosis or prognosis is made on the basis of the atrophy demonstrable by roentgenography.

Although it may not give rise to appreciable lesions, traumatism of the joints is always accompanied by atrophy of bone, generally of the irregular and patchy type. This atrophy sometimes lasts a long time and appears to be the only cause of the state of post-traumatic arthropathy which usually is presented in these cases. Its differential diagnosis from other atrophic processes can be made best from the clinical development.

Osteomyelitis does not produce atrophy while its foci are not limited, but when soft parts or a joint are invaded atrophy, which is usually of the irregular type, sets in. Syphilitic osteo-arthritis do not cause atrophy, but gonorrhoeal arthritis gives rise early to very diffuse atrophy. Malignant tumors of the bones are accompanied early by an intense atrophy beneath the growth.

M. M. MATTHIES.

**Barker, W. C.: Roentgen-Ray Therapy in Hyperthyroidism.** *Hahnemann. Monthly*, 1919, liv, 502.

A short introductory description of the physiology of the thyroid gland, symptoms of various forms of hyperthyroidism, and interrelationship of the various endocrine glands prefaces the article on therapy proper. As contra-indications to the use of the roentgen ray are mentioned simple enlargements of the thyroid without hyperthyroidism, mild types occurring in young people, temporary forms follow-



ing acute infections, and very acute cases in which the patient is prostrated to the verge of collapse. In the last, however, it may be used advantageously after a preliminary period of rest, diet, and medical treatment.

Regarding the technique used, the author divides the neck region into four areas for crossfire purposes, including the location of the thymus. He uses a very penetrating ray, backing up not less than a  $9\frac{1}{2}$ -inch spark produced by a Coolidge tube, and gives not more than an epilation dose filtered through 3 millimeters of aluminum. The treatment is repeated every four weeks until the patient feels better, when the intervals are lengthened. Amelioration of the tachycardia is one of the best indicators for regulating the treatments. In conclusion, the important facts are restated as follows:

To determine the areas to be treated, a fluoroscopic examination should be made.

It is necessary to include the thymus, not only when a hyperplasia is demonstrated, but also when the Crotti syndrome is present.

Use the Coolidge-tube technique, giving the full dosage and high penetration to inhibit cell function.

As the patient improves, lengthen the intervals and thereby prevent hypothyroidism.

Always keep in mind that the reduction of the size of the thyroid for cosmetic purposes, for relief from pressure, or for removal of tumors, whether benign or malignant, is a problem for the surgeon, and should never be attempted by roentgen therapy.

The use of the roentgen ray in the treatment of the thyroid is only to inhibit cell action in hyperthyroidism. It will here take the place of surgery, with results which are as good and without the scar and danger attending an operation.

ADOLPH HARTUNG.

**Aimé, P., and Solomon, J.: The Radiological Diagnosis of Transdiaphragmatic Hernia of the Stomach Resulting from War Wounds.** *Am. J. Roentgenol.*, 1919, vi, 376.

The advent of the war with its large number of injuries to the diaphragm and the extensive use of radiological examinations in gastro-intestinal disturbances has led to a comparatively frequent discovery of transdiaphragmatic herniæ of the stomach, a condition which was formerly considered to be rare. Most of the cases heretofore reported were found at autopsy.

An autopsy record, cited in detail, shows, first, that wounds of the diaphragm do not have any tendency toward spontaneous healing; second, that the usual clinical methods of investigation are not capable of revealing a diaphragmatic hernia definitely; and third, that it is of the utmost importance, if the patient's condition permits, always to employ the radiological examination in every case of a wound of the thorax accompanied by digestive disturbances. Unfortunately immediate surgical intervention is sometimes necessary as was the case in several instances recorded.

In the authors' three cases of transdiaphragmatic hernia of traumatic origin, which are minutely described, the radiologic examination furnished the real evidence of the condition. In all there were indefinite dyspeptic symptoms and the examinations revealed part of the stomach above the diaphragm with a constricted portion where it passed through.

These traumatic herniæ do not tend to reduce themselves spontaneously but form adhesions, differing in this respect from herniæ of congenital origin. A case of the latter type is described in which part of the stomach was seen extending through a hernial opening in the diaphragm. Subsequently this hernia reduced itself spontaneously but later formed again. Another case is mentioned in which the stomach occupied an unusually high position, due probably to an anomalous congenital formation of the diaphragm.

ADOLPH HARTUNG.

### HOSPITAL, MEDICOLEGAL, AND MEDICAL EDUCATION

#### Compensation for Both Injuries and Malpractice.

*Smith vs. Baltjes Fuel & Building Material Co. et al. (Mich.)*, 169 N. W. R., p. 943.

This case was a matter in which the plaintiff was injured by having his arm broken when in the employ of the defendant Company. While receiving compensation from the State Accident Fund Smith sued the attending physician for alleged malpractice in connection with this injury and received \$2,000.00 in settlement thereof.

The present case is predicated upon a petition by the defendant Company for an order to cease further payments under this compensation because of the money received from the alleged malpractice claim. The declaration of the suit against the doctor alleges that the plaintiff's condition was the result of malpractice on the part of the physician and not the result of the original injury.

The Industrial Accident Board found that Smith's condition, which was one of total disability, was due to the original accident and not to any malpractice; that his receipt of money from the physician did not constitute an election within the meaning of the Workmen's Compensation Act; and that the allegations in his declaration in his suit against the physician were not binding upon him but might be taken as evidence only.

The Board does not think that the fact that Smith started suit against the physician precluded him from asserting his rights under the Compensation Act. The Reviewing Court holds that the opinion of the Board is correct and that the State Accident Fund should not have credit for the \$2,000.00 which was received by Smith from the physician in addition to the amount due from it to him under the terms of the statute. The Michigan Law makes no provision for such reduction of claim. The Court stated that the application is a matter, not for judicial interpretation, but for legislative action.

J. A. CASTAGNINO.



**Contract for Future Treatment—Patient's Inability to Receive Treatment.** *Med. Rec.*, 1919, xcvi, 23.

A patient had contracted with a physician for treatment to be administered to him by the physician at the latter's office for a period of one month from a specified date, the treatments to be paid for in advance. The patient became too ill to attend the physician's office to receive the treatments and brought action to recover the moneys paid the physician.

There was no evidence in the case that this sum was paid to the physician as a retainer and the service to be rendered and received depended upon the ability of the patient to receive and the attending physician to perform. Therefore the rule that in the event of illness to either party which prevents him from performing his portion of the contract the money paid should be returned is equally applicable to both parties to the contract. Had the physician become ill instead of the patient and rendered unable to give the services contracted and paid for, he would doubtless be required to pay back the consideration for the services.

The Court applied the rule and quoted from the case of *Fisher vs. Monroe*, 12 N. Y. S., p. 273.

"The obligation of the party who was to receive the services to pay is conditional upon the obligation of the party who was to render the services to perform and vice versa. If the contract of employment is to continue operative and binding those interdependent obligations must continue to exist, and if one party is excused from the performance of his obligation, the obligations of the other party must likewise come to an end." J. A. CASTAGNINO.

**Evidence in Action for Services Opposed by Claim of Malpractice.** *McCoy vs. Gage (Calif.)*, 177 Pac. R., p. 296.

In a suit by a physician for pay for professional services a defense was interposed of unskillful treatment in an attempt to defeat the action by the doctor and to recover damages.

The testimony as brought out at the trial showed that the plaintiff had been called to attend the defendant who was suffering from a fracture of the neck of the femur. At a first visit by the plaintiff the fracture was reduced and a splint applied to the limb. A trained nurse was called to assist in the case and the plaintiff continued his treatment for several months during which time he made eighty-five visits. In addition to treating the defendant for the broken limb, he was called to prescribe also for pneumonia and rheumatism.

From all the testimony, even that produced by the defendant, it appeared that so far as the fracture was concerned, the results obtained were better than the average. A medical witness, after having testified under direct examination in response to a hypothetical question detailing the services, stated his opinion as to their value. On cross examination he was asked whether his opinion would be altered

as to the value of the services when the question assumed other matters not shown by the evidence. Objection to this question was sustained: The Reviewing Court held that this was not an error.

The same witness was asked on cross examination if in cases of this character it was not customary to take a roentgenogram. The objection to this question was also sustained, the Reviewing Court holding that it could not see how any prejudice resulted to the defendant by reason thereto because it was stated that the taking of the roentgenogram would be valuable for the purpose of diagnosis only and that it seemed very clear from the evidence that the diagnosis made by the plaintiff in the first instance with its aid was correct. In addition to this the value of the roentgenogram was gone into quite thoroughly in the case by other witnesses. The defendant was allowed to cross-examine this witness on all matters contained in the direct examination and it was discretionary with the Court to refuse to allow the witness to be cross-examined and led into a discussion outlining a course of treatment not included in the facts.

The defendant also alleged error in the sustaining of objections to questions asked the trained nurse who attended the defendant under plaintiff's direction. The Court does not believe that the testimony of a trained nurse is proper or competent evidence to show whether the treatment administered by the plaintiff was either proper or improper. As to what the witness has seen other physicians do in like cases and what she considers good or unskillful treatment is not the proper way to either prove or disprove malpractice.

The last-mentioned point is not a new one for it has been decided by practically every court in the United States that the only proper way to prove malpractice is by the testimony of skilled practitioners. J. A. CASTAGNINO.

**Payment for Hospital Service.** *Elliot Hospital vs. Turcotte*, New Hampshire Supreme Court. 105 Atlantic, p. 361.

In the case reported of the Elliot Hospital vs. Turcotte, the Reviewing Court had under consideration an action by the hospital against a former patient for services. It seems that the defendant was injured while in the employ of a Company and was taken to this hospital by the doctor who rendered first aid. The officers of the hospital did not know that the defendant was brought to the hospital by F. & Son and the account was therefore opened in the name of the defendant. When on his discharge from the hospital the defendant was asked by the plaintiff who was to pay the account he replied, "F. & Son," and a memorandum to this effect was entered on the ledger account. No demand was made upon the defendant for this account until after his claim against F. & Son had been settled, when suit was brought against him.

The defense was predicated on the theory that the hospital had no claim against the injured



man. The Trial Court entered judgment for the plaintiff, its action being based upon a breach of the defendant's promise to pay. To authorize a verdict against the defendant this promise must be found as a fact. The promise may be either an expressed promise or drawn from attending facts and circumstances from which a mutual understanding would arise that payment was to be made. Again, the circumstances may be such that it would be inequitable to permit the defendant to deny the promise.

There was no evidence of an expressed promise to pay. Neither did it appear that the service was to be gratuitous. The fact that the defendant understood that the hospital was to be paid by F. & Son is not consistent with a promise on his part to pay if they did not. If the defendant accepted the service with the understanding that in no event was he liable therefore, his concealment of such understanding from the plaintiff was evidence upon which the Company found that he was estopped to deny his promise to pay. Under the circumstances this would ordinarily be inferred from his acceptance without any objection of valuable services rendered with the expectation of payment.

Whether the defendant promised to pay or was estopped to deny such promise and whether the plaintiff was estopped now to assert such promise, were held questions of fact to be found from the evidence and the verdict would be found as these facts should be determined. J. A. CASTAGNINO.

### MILITARY SURGERY

**Lockwood, C. D.: A Review of Five Hundred Operations for Battle Casualties.** *California State J. Med.*, 1919, xvii, 182.

Non-penetrating wounds of the chest may cause hæmothorax, infarction, etc. Lung infection is rare. In severe injuries the lung collapses. Closure of a sucking wound with pneumothorax gives instant relief.

In regard to injuries of the main blood vessels the following conclusions are drawn:

1. In most instances suturing is inadvisable.

2. In cases of blood-vessel injury associated with extensive injury to bone, it is best to amputate.

3. In operating, a temporary ligature should be applied above the injury.

In the case of joint injuries war surgery has shown that the synovial membranes are very resistant to infection. Joints may be opened and closed if ordinary methods of obtaining asepsis are employed. Most infections are due to the pressure of drainage tubes and the irritation of antiseptic irrigations.

The 500 cases reported included 162 fractures, most of which involved the long bones. The deaths of men so injured were due to gangrene and shock. In all cases of fracture the treatment consisted of the application of extension by means of various modifications of the Thomas splint.

Twenty-nine amputations were done. Experience has shown that in many instances the treatment was too conservative. The best results were obtained from guillotine operations or the use of reflected flaps with wide stumps. In amputations of the legs the best stumps are obtained at the juncture of the middle and upper third. The author believes that it is better to amputate above the knee rather than less than 2 inches below it.

In cases of head injuries the mortality early in the war was 60 per cent. During the last few months this was reduced to 20 per cent as a result of standardization of the technique of treatment and the application of the principles of débridement. All manipulations were done with instruments. When the dura was injured foreign bodies and lacerated tissues were removed by irrigation with hot saline solution and suction with a soft rubber catheter. If possible, the dura was then closed.

Shock occurred very frequently. In the prognosis the blood pressure is of great importance. The critical level is 80 millimeters of mercury. In such cases there were often 2,500,000 more corpuscles per cubic centimeter in the blood in the capillaries than in that in the veins, a fact which indicated that the blood was stagnated in the former. An important factor in producing shock is exposure to cold. The most effective method of increasing the blood pressure is the transfusion of citrated blood.

H. J. VAN DEN BERG.



# GYNECOLOGY

## UTERUS

**Strong, L. W.: The Physiology and Pathology of the Endometrium.** *Am. J. Obst.*, 1919, lxxx, 139.

The specific function of the uterine mucosa is to prepare for the nidation of the ovum and this function is exercised periodically. The physiological secretions of the uterine glands must have a relation to nidation or to menstruation.

Frankl and Aschner and Halban Frankl state that they have demonstrated a tryptic ferment in the secreting stage of the mucosa but it does not appear from the descriptions that this work was carried on under bacteria-free conditions. The author has extracted and digested nine specimens of mucosa in the secreting stage in the same way, but although tyrosin crystals were sometimes demonstrable, this does not appear to be sufficient proof of the presence of trypsin. Frankl explains the desquamation of the mucosa during menstruation as the result of autolysis due to the tryptic ferment. He states also that the incoagulability of the menstrual blood is due to this ferment. Why the tryptic ferment does not act during pregnancy is not explained by Frankl's theory.

It has been held generally that the corpus luteum controls the early stages of pregnancy and its removal during the first month would inevitably result in abortion. That this is not necessarily true has been proved in three cases at the Woman's Hospital where the removal of a corpus luteum verum during the second month did not interrupt the pregnancy.

The relationship between the sexual gland hormones and the other accessory glands of internal secretion are too complex for any simple explanation of the menstrual function.

One of the most significant observations made in recent years on the physiology of the endometrium is that of Schroeder and others who state that at menstruation there is normally a complete destruction of the functional layer.

The significance of the finding lies in the bearing it has upon pathologic processes occurring in the mucosa. If there is complete destruction down to the basal layer every twenty-eight days, it is plain that the mucosa can exhibit none of the characteristic alterations that denote chronic inflammation. Thus it cannot show cicatrization due to fibroblastic deposition of connective-tissue fibrils and elastic fibrils.

The mucosa continually seen in patients who have been menstruating from one to several days gives no evidence of such complete destruction. The common finding is a persistence of the functional layer in the secretory stage. The superficial epithe-

lium is often still demonstrable and there is no evidence of autolysis. Many mucosas also give evidence of fibroblastic change in the stroma and slight but demonstrable cicatrization, showing that a chronic reaction is possible.

The signs of inflammation in the mucosa uteri are masked in this regard, namely, that exudates of leucocytes, round and plasma cells are all to a certain extent physiological. In the last days of the secretory period there is an outpouring of polynuclear cells which probably hastens the destruction and absorption of the mucosa at menstruation. Lymphoid cells are diffusely scattered in the normal stroma and form small lymphoid aggregations at all stages of the menstrual cycle.

The physiological data concern the secretions, the histological are the cycle changes, and the pathological are endometritis and hyperplasia.

The secretions and cycle changes are definitely related to each other, the secretions being the product of the mucosal development. There is practically no secretion during the proliferative phase, and the premenstrual stage may well be termed the secretory. Therefore secretory and cyclic changes may be considered together with reference to pathologic change.

The general conclusion from examination of many curettings obtained at the Woman's Hospital in the past six years from all types of conditions received indiscriminately is that the uterine mucosa is very resistant to pathologic change.

In no case did the endometritis produce alterations in the glands or the stroma such as to make the cycle phase unrecognizable. There were no alterations in the number or the size of the glands or their outlines which were traceable to the inflammatory exudate. The stroma indeed was sometimes fibroblastic, but that also occurs without the presence of inflammation.

Out of the total of fifty cases of salpingitis in which the uterine mucosa was also available for examination, sixteen (about 30 per cent) showed an endometritis of greater or less degree. From a practical standpoint the conclusion may be drawn that the cause of irregularities and hemorrhage is much more frequently adnexal disease than endometritis. Atypical menstruations are to be referred to changes in the endocrine system rather than in the endometrium. Hyperplasia also has little effect upon the histology of the normal menstrual cycle.

EDWARD L. CORNELL.

**Schwarz, O. and Kohlbury, C. O.: Chronic Endometritis.** *J. Missouri M. Ass.*, 1919, xvi, 209.

The authors of this article state that the condition known as chronic endometritis (the term



being used in the restricted sense to designate lesions of the endometrium which are of true inflammatory nature) is quite common. They studied in detail 305 specimens, 225 of which were obtained by curettage and 80 by hysterectomy or at necropsy. Of these, 70 showed chronic interstitial endometritis. In the diagnosis of these cases no particular importance was placed upon the amount of small-cell infiltration if definite plasma cells were found.

Usually, however, these cells were present in large numbers. When small round cells appear alone they are found in considerable quantities, penetrate the upper half of the endometrium, and are grouped around the glands. A search was made also for polynuclear leucocytes.

The authors divided the specimens into classes according to the phase of the menstrual cycle to which they belonged. They found 16 in the premenstrual, 1 in the menstrual, 15 in the postmenstrual, and 37 in the interval phase. The glands were pathologic in 12 cases (gland hypertrophy, 5; gland hyperplasia, 7). In 2 cases there was tuberculosis and in 1 the specimen was a senile endometrium.

The article includes a discussion of the clinical histories and a full account of the method used to obtain scrapings free from blood and prepare them in the laboratory for study.

In the authors' opinion an even larger proportion of cases of chronic interstitial endometritis probably fail to come to light due to the fact that in hospital and dispensary service it is customary to treat chronic salpingitis and pelvic cellulitis by palliative methods.

C. M. GRUBER.

**McLorian, M.: Studies on Cases of Uterine Abnormality.** *Med. J. Australia*, 1919, ii, 5.

McLorian reports two cases of double uterus seen by him within a few weeks. The first was that of a multipara who had two children. The symptoms and examination suggested an ordinary normal retroverted uterus with relaxed vaginal outlet. Operation revealed a bicornate structure, each uterus possessing its own tube and ovary and merging below into a common cervix. The whole organ lay in the pouch of Douglas and was quite movable. No correction of the abnormality was attempted, but suspension by intra-abdominal shortening of the ligaments was done.

The second case was that of an unmarried woman who had suffered for five years from various "nervous" troubles. Menstruation did not begin until she was 17, but was regular and painless. The patient had become a drug fiend and neurasthenic. She looked ill and complained of severe pain in the left side which developed gradually and then became constant. The abdomen was very tender and an irregular swelling could be felt which had its origin in the pelvis. The hymen was intact and the uterus, which was small and anteflexed, was pushed over to the right side. The left fornix was filled with a large, irregular mass which was tender to the touch

but seemingly separate from the uterus. Operation revealed a double uterus. The right was normal but the left uterus and tube contained blood and the cervical canal was obstructed. The whole mass on the left was removed, the right with its adnexa being left intact. The patient made a good recovery and has been free from all symptoms for the four months since the operation.

In discussing this condition the author bases his observations on studies of the comparative anatomy of lower animals. An illustration of the distribution of the vagus nerve in the Tasmanian devil shows a direct branch from the main nerve to the broad ligament where a plexus is formed for distribution to the tube, the uterus, and the ovary. A direct connection between the female generative organs and the brain may account for various reflex symptoms accompanying generative disorders. The author is of the opinion also that a regulating region for the functions of the uterus is situated probably at the fundus at the orifice of the fallopian tube. The article contains six illustrations of the generative systems of lower animals.

L. R. GOLDSMITH.

**Soler Julia: Abdominal Hysteropexy in the Treatment of Uterine Prolapse** (La histeropexia abdominal en el tratamiento de los prolapsos del utero). *Rev. españ. de cirug.*, 1919, i, 316.

Uterine prolapse is dependent upon a change in the position of the uterus with regard to the vaginal axis.

In operating upon a case of prolapse of the uterus its causes must be corrected. These may be hypertrophy of the cervix, lack of perineal tone, relaxation of the ligaments, etc.

The uterus must be placed in a position as near to normal anteversion as possible so that abdominal pressure acts upon its posterior wall.

In the abdominal hysteropexy in which the anterior wall of the uterus is fixed to the parietal peritoneum the position is not physiological.

If the adherence is permanent the prolapse is corrected, but experience has shown that sometimes the weight of the uterus drags on the peritoneum, forming a sort of cord so that it is again placed in an unphysiological position and prolapse recurs. This may be the case even if vaginal plastics be done, though in such instances the prolapse is deferred.

Abdominal hysteropexy ought therefore to be discarded as a method of treating uterine prolapse.

Prolapse in young women should be treated by extra-abdominal shortening of the round ligaments and reconstruction of the vaginal walls and perineum. If the extra-abdominal shortening of the ligaments is difficult or adnexal complications demand a laparotomy, intra-abdominal shortening should be done.

In women at the menopause the treatment of choice when there are adnexal complications is vaginal hysteropexy and plastic vaginal operations.



As a palliative measure when the general state or age of the patient does not permit these methods the method of Garcia de la Serrana may be employed, viz., closure of the vagina with a silver plate.

W. A. BRENNAN.

**Boyd, G. M.: Some Remarks on Inversion of the Uterus with the Report of a Case of Sixteen Months' Standing.** *Am. J. Obst.*, 1919, lxxx, 161.

This rare accident occurs probably about once in 128,000 labors as shown in statistics collected by Jones. While inversion of the uterus usually follows injudicious treatment of the placental stage of labor, it is sometimes unavoidable, the result of uterine relaxation. If the accident is acute, manual reposition can be carried out successfully. Taxis should be started near the cervical ring, not at the fundus, and it is important to make pressure upon the protruding mass in the axis of the pelvic canal. This treatment, however, will not always suffice as demonstrated by the author's first operative case.

A para-iii was delivered by forceps of a 9-pound girl. Free bleeding followed the delivery. When the uterus was compressed after the usual method of treating the third stage of labor the fundus left the operator's hand suddenly and spontaneously, the uterus and vagina turning completely inside out. The whole mass was prolapsed and hung between the patient's thighs. To it was attached a firmly adherent placenta. The hæmorrhage then became alarming and continued until the placenta was detached. An attempt was made to replace the uterus but was without success. Seven hours after delivery, the patient was anæsthetized and an attempt made to replace the uterus by taxis. Although persisted in for some time, this method also was unsuccessful.

An abdominal section was then performed for the purpose of making a manual dilatation of the constricted cervix by inserting the fingers into the crater-like excavation. This was easily accomplished, and as the assistant continued pressure from within, the uterus was finally replaced by taxis. A uterine douche was then given and the organ firmly tamponed with sterile gauze. The patient gradually gained in strength and was discharged in the third week of the puerperium fully recovered.

The second case, a chronic inversion, was operated upon successfully by the Spinelli method. The patient, a primipara, was delivered Nov. 6, 1917, after a prolonged and painful but not instrumental labor. The placenta was adherent, and when traction was made for its removal, inversion occurred. The patient stated that she bled profusely and that a mass protruded through the vagina. Her attending physician apparently did not appreciate the gravity of the accident and made no attempt to replace the uterus, telling her that it was a tumor which should be removed in forty days. She bled freely throughout the puerperium but with this exception was normal. She did not suffer pain

nor were there symptoms of infection. She nursed her infant until its death at the age of eleven months old. Seven months later she had a serious hæmorrhage which forced her to remain in bed for one week. She was then told by her physician that the uterus was out of place.

The true nature of the trouble was not discovered until February, 1919. The uterus was then completely inverted and well involuted. It filled the cavity of the vagina and bled freely when touched. On March 5, 1919, after the vagina and uterus had been sterilized, a metal catheter was introduced into the bladder to locate its base. The perineum was then depressed with a weighted speculum in order to bring the uterus well into view. The latter was then drawn down with a double tenaculum inserted in the fundus. First, a transverse anterior vaginal incision 5 centimeters in length was made just above the cervix. The bladder was separated but the cul-de-sac was not opened. Second, a median longitudinal incision was made through the anterior lip of the cervix, extending 2 centimeters toward the fundus. With the cervical constriction removed, an attempt was made to replace the uterus but was unsuccessful. The anterior cul-de-sac was then opened and a longitudinal incision in the anterior uterine wall made to sever the uterus completely. This was carried up to within 1 centimeter of the fundus. When the cavity of the uterus was opened, the invaginated oviducts were found to be normal and there was no evidence of adhesions. The uterus was re-inverted by making traction upon the divided lips of the cervix and forcing the fundus upward with the thumbs. There was then found a decided outward bulging of the anterior uterine wall so that in order to suture the muscle and its perineal covering accurately, it was necessary to remove the wedge-shaped piece from each cut edge. The incision in the uterus was closed with deep and superficial interrupted catgut sutures and the vagina replaced in the pelvic cavity. The vaginal incision was then closed after the peritoneum had been sutured to the uterus. A small gauze drain was introduced into the vaginal wound between the uterus and bladder and a second drain placed in the uterine cavity.

The patient made an uneventful recovery except for a slight elevation of temperature during the first week, attributed to a mild saprophytic infection. She left the hospital two weeks after operation.

EDWARD L. CORNELL.

**Kreutzmann, H. J.: Is It Possible Through Co-Operation of Surgery and Roentgenization in the Treatment of Fibromyomata Uteri to Further Improve the Results Obtained by Surgery?** *Am. J. Obst.*, 1919, lxxx, 179.

The author quotes from Broun's article in the same journal, March, 1919, in which the value of the X-ray and radium is questioned.

Surgery and roentgenization are not antagonistic to each other; they must work hand in hand. The



question should be: Can the co-operation of surgery and the X-ray still further improve the results as reported by Broun? The answer must be: Undoubtedly, it can!

Most of the cases not complicated by degenerative changes or adnexal affections are amenable to X-ray treatment. Among those so complicated are quite a number that offer no contra-indication to the use of the X-ray. Such cases are the oedematous type of myoma, calcareous degeneration, serous cysts of the ovary, and hæmatosalpinx.

A segregation of 25 per cent of all cases for operation appears a reasonable estimate. This percentage corresponds to the author's personal experience in private and hospital work. The vast majority of fibromyomata uteri seen were uncomplicated. The immaterial changes in the adnexa that were observed in many women operated upon do not exclude the use of the X-ray. This latter statement is based on five years' work with the roentgen rays in gynecology.

Cure is obtained without loss of life, without any morbidity or injury during treatment, without any evil after-effects. None of the 200 women will suffer from such things as severe colon bacilli infection of the kidneys, vesicovaginal fistula, re-opening of incisions, and mural abscess in the abdominal wound. None of these 200 women will return with symptoms directly referable to the end-results of the operation.

To sum up, co-operative treatment of fibromyoma uteri—surgery and the X-ray combined—will reduce mortality to nil or almost to nil and avoid morbidity, injury, and the after-effects of treatment in great measure.

EDWARD L. CORNELL.

**Recasens, S.: The Choice of Dosage in the Radio-Active Treatment of Carcinoma of the Uterine Cervix** (La elección de dosis en el tratamiento radio-activo del carcinoma cervical uterino). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 66.

According to Recasens, the treatment of choice for carcinoma of the uterine cervix is radio-active treatment but this should not exclude operative treatment when the condition is so limited that all of the neoplastic elements can be removed by surgical methods.

The dose which should be employed in radio-active treatment depends upon the form and the size of the neoplasm, the patient's general condition, and the condition of the blood. Very pronounced leucopænia is an absolute contra-indication to the use of massive doses. In general, moderate doses frequently repeated are tolerated better than larger doses given at longer intervals. Usually applications lasting for more than twenty-four hours are not well borne.

Continued high temperature requires the temporary suspension of the radio-active treatment. When each application is followed by a pronounced reaction, the duration of the application should be

decreased and the interval between applications increased.

In cases of the fungous type of carcinoma the filters used should not be very thick, but for the infiltrating forms and, in general, all the scirrhous forms, it is best to use very thick filters (2 millimeters of brass or 6 millimeters of aluminum).

In certain ulcerative types of carcinoma of the uterine cervix of rapid growth which lead in a short time to copious hæmorrhages due to destruction of the walls of the great vessels, massive doses should be applied once or twice. If these do not stop the progress of the growth, the condition must be considered outside the range of this method.

M. M. MATTHIES.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Becerro de Bongoa, R.: The Surgical Treatment of Suppurating Adnexal Lesions Ruptured into the Intestine** (Tratamiento quirúrgico de las lesiones anexiales supuradas abiertas en el intestino). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 63.

One of the occurrences which greatly complicate the treatment of suppurative salpingitis, ovarian abscess, and peri- or para-uterine collections of pus, is rupture into the intestines.

The condition may go on to spontaneous cure, but this happens most frequently when the peri- or para-uterine accumulations drain spontaneously.

Pyosalpinx opened into the intestine is nearly always, if not always, a condition which is difficult to cure by surgical procedures but by other means is incurable. The lesions are progressively complicated by a series of crises of the septic process, each more acute than the last and accompanied by defense reactions which are prejudicial in that they result in adhesions to neighboring organs which are the cause of pain.

The process leads, by suppuration and suffering, as also by the concomitant menorrhagia due to venous lesions and the profound fungous modification of the uterine mucosa, to a general state of weakness in which the patient usually becomes tuberculous.

As there is no other definitely curative procedure the author believes that intervention by laparotomy is indicated in every case, in spite of the communication with the intestine, but he does not minimize the danger of such an operation.

The gynecologist ought always to take into consideration the possibility of a salpingo-intestinal communication before operating.

The period of greatest virulence of the bacteria having passed (which can be determined from the temperature and a study of the leucocyte count—Arneth's formula), the author believes that the only remedy is extirpation of the pyosalpinx even though a fæcal fistula may result.

Evacuation of the purulent content through the vagina he considers insufficient as the crises of



re-infection recur after the colpotomy just as they did before it was performed.

Efficacious treatment consists in the extirpation of the upper genital tract *en bloc*, from the uterine isthmus upward, either by the American operation, from the area least involved to that of the greatest adhesions, or by hemisection. In grave cases with very firm salpingo-intestinal adhesions, the author extirpates the tubes, first sectioning them to let out the pus. He then resects the tube or ovary, leaving the adherent portion which contains the perforation attached to the intestine.

The parietal portion of the abscess which is left attached to the intestine he cuts down as much as possible, leaving only the portion that is very intimately adherent. He then attempts to cover the portion left on the intestine by means of a seroseros suture of the nearest intestinal coverings. If this is not possible, he sews the borders of the patch together approximately concentrically.

The operation is then completed by the placing of an intra-abdominal dressing made of strips of cloth, not gauze, which is fitted about the suture. Above this dressing the cloth is used to wall off the rest of the peritoneal cavity from the pelvis. These strips, misnamed drains, have the advantage that they may be withdrawn very easily when the time comes to remove them. They wall off the pelvic cavity and convert it into an antrum in communication with the exterior through the lower part of the laparotomy wound. This antrum becomes a suppurating cavity with a tendency to cure with postoperative care and it is here that the intestine may open, forming a fæcal fistula.

The fæcal fistula can be cured if it is cared for skillfully. The strips of drainage material come out almost spontaneously and following them the purulent and fæcal exudate. The author then inserts several large rubber tubes like those used in prostatectomy and gradually decreases their size with the advance of the cicatricial granulation.

The care of the intestine also requires special attention. The portion below the fistula must be emptied daily by means of an enema. Occasionally the patient should be constipated in order that the evacuation by the fistula may be temporarily suppressed so that the cicatrization of the fistulous antrum may progress.

Thus the cure of the fistula will follow when the laceration is not too extensive and when the condition is not tuberculous. Direct primary suture of the laceration or perforation is unsuccessful.

M. M. MATTHIES.

**Guilera Molas, L.G.: A Review of the Embryology of the Graafian Follicle and the Histogenesis of the Corpus Luteum.** (Revisión embriológica del folículo de Graaf e histogénesis del cuerpo lúteo). *Med. Ibero*, 1919, Numero extraordinario, I Cong. nac. de med. y cirugía, 68.

The theories regarding the histogenesis of the graafian follicle are diverse. The great majority of

embryologists and histologists, however, hold that the ovule and the granulosa are derived from the coelomic epithelium and that the theca and stroma have their origin in the wolffian connective tissue. A few investigators, and of these chiefly Koelliker, believe that the origin of the ovule and granulosa is distinct and admit only that this process proceeds from the germinal epithelium.

A short study of the embryology served to convince the author that the difference of opinion in regard to the histogenesis of the follicle was due largely to the technical difficulties of discerning in young embryos the epithelial (coelomic) or connective-tissue (wolffian) nature of the elements which constitute the so-called "cords of Pflueger." He therefore studied human embryos and the embryos of cattle by the method of Achúcarro del Río which he believes is much more accurate than others.

This technique enabled him to make out the exact nature of any given element at any period and wherever situated and by this means he has followed in detail the embryologic evolution of the ovary in these species and arrived at the following conclusions:

1. In the epithelium of the coeloma there is more than one type of cell. Certain cells with nuclei of chromatic rods (similar to those seen by Waldeyer and considered by him to be buds of the granulosa) are nothing but connective-tissue cells which have intruded among the epithelial cells.

2. In the cords of Pflueger there are only two cellular types—elements proceeding from the coeloma and connective-tissue elements which are given off from the stroma and penetrate among the epithelial cells. These are intimately mixed.

3. These cells are isolated one by one by the connective-tissue cells in such a way that the primary follicle is nothing more than a single coelomic epithelial cell surrounded by the connective-tissue elements of the stroma.

As these conclusions, however, did not definitely clear up the histogenesis of the corpus luteum, the author studied this subject also for a number of years. He admits the thecal origin of the corpus luteum, basing his opinion principally on the thecal hypertrophy in the follicles at the point of bursting, and, above all, on the constant addition, during the first stages of the corpus luteum, of new thecal cells and even of stroma cells to those already transformed into lutein cells. While admitting the thecal participation and the diversified histogenetic character of the theca and granulosa, however, he does not admit the intervention of the two membranes in the constitution of the corpus luteum as do Van Stricht and others.

In order to answer this question, the author therefore made embryologic studies as the result of which he found that there is no histogenic dissimilarity between the granulosa and the theca as both of them are of the nature of connective tissue. Furthermore, among a great number of ovaries he collected



in the Gynecological Clinic at Madrid he found two with recently broken follicles and in these he was able to verify the persistence of the parietal granulosa and its perfect vitality after the rupture. He therefore concludes as follows:

1. The granulosa persists after the rupture of the follicle.
2. It participates jointly with the theca in the constitution of the corpus luteum.
3. The theca as well as the granulosa being connective-tissue coverings, the corpus luteum which proceeds from them is exclusively a connective-tissue formation.

M. M. MATTHIES.

#### EXTERNAL GENITALIA

**Chaffin, R. C.:** Cystocele, with or without Descent of the Uterus, with Especial Reference to the Technique of the Interposition Operation. *Am. J. Surg.*, 1919, xxxiii, 183.

The development of cystocele takes place usually in one of two ways. One type no doubt is due to the backward displacement of the uterus which is dependent upon stretching or laceration of the pelvic floor by child-birth, whereby strain is brought on the hammock structure in the pelvis made up of the broad ligament, the uterosacral ligament, and the round ligaments. With the destruction of the pelvic floor, the uterus usually starts downward, carrying the bladder, tubes, ovaries, and rectum with it. The other type of cystocele development is generally brought about by infection by streptococci, gonococci, or other organisms. Eventually the uterus is fixed posteriorly in the pelvis with the adnexa. This position results in an increase in the antero-uterine space, and if this is not closed by adhesions a great increase in intra-abdominal pressure is brought to bear on the bladder and the anterior wall of the vagina. In this type of case a protruding bladder and a fixed uterus are found.

Usually the diagnosis is easy but in the less evident cases the patient can be put in the squatting position and told to bear down. If examined in this position a cystocele may be demonstrated which is not apparent in the lithotomy position.

The lack of uniform success with the various corrective measures for cystocele led to the development of the so-called vaginal suspension, interposition or transposition of the uterus. A fixed uterus requiring laparotomy is not a contra-indication, and interposition can be easily effected after salpingectomy or oophorectomy. In selecting cases several points should be kept in mind. The patient cannot have children after this treatment and therefore she must either be sterilized or operated upon after menstrual function ceases. The technique found easiest and quickest is as follows:

1. Grasp the uterus with the tenaculum and pull centrally. Curette if necessary and, also if necessary, repair the cervix.

2. Make an inverted T incision and dissect the vaginal wall from the cervix and bladder up to  $\frac{1}{2}$  inch from the meatus.

3. Apply a curved forceps carefully to the free edges of the flaps.

4. Dissect the bladder from the uterus clear up to its peritoneal reflection and open the peritoneum.

5. Deliver the uterus by successively grasping the fundus with two single tenacula.

6. Inspect the tubes and ovaries and note also the size of the uterus, cutting away the necessary amount from the body of the uterus. At this stage the tubes should be severed.

7. Insert suspension sutures of Number 2 or 3 chromic catgut. Replace the uterus in the abdomen, rethread the needles, and bring the ends of the sutures through the flap from within outward.

8. Cut away redundant vaginal flaps and insert the remaining sutures.

9. Reconstruct the pelvic floor. I. W. BACH.

#### MISCELLANEOUS

**Litzenberg, J. C.:** The Use of Benzyl Benzoate in Dysmenorrhœa. *J. Am. M. Ass.*, 1919, lxxiii, 601.

Of 43 patients there were 35 (81.3 per cent) who were relieved of pain with the use of benzyl benzoate. In 27 cases (62.7 per cent) the pain was completely stopped, and in 8 cases (18.5 per cent) the suffering was greatly relieved but not entirely eliminated. In 2 cases (4.6 per cent) the pain was somewhat relieved, but not to any great extent. In 6 cases (13.9 per cent) there was no benefit whatever.

Fifteen patients were completely relieved from pain after one dose (2 teaspoonfuls of 20 per cent emulsion); 12, after two doses at two-hour intervals; 1 required three doses; 1, four doses; and 1, five doses. Those who obtained no relief took from two to six doses.

Other symptoms, headache, backache, etc., were not uniformly benefited.

The cause of dysmenorrhœa is still unsettled. Antispasmodics are logically indicated, for in spite of doubtful etiology the painful spasm of the uterine muscle is incontrovertible. Benzyl benzoate has an antispasmodic action and is practically non-toxic, which gives it preference over atropin.

EDWARD L. CORNELL.

**Cullen, T. S.:** The Distribution of Adenomyomata Containing Uterine Mucosa. *Am. J. Obst.*, 1919, lxxx, 130.

Adenomyomata consisting of a matrix of non-striated muscle and fibrous tissue with typical uterine mucosa scattered throughout are to be found in the uterus, round ligaments, utero-ovarian ligaments, uterosacral ligaments, rectovaginal septum, and umbilicus.

Occasionally large quantities of normal uterine mucosa are found in the ovary.

EDWARD L. CORNELL.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Quigley, J. K.: Corpus Luteum Extract in the Vomiting of Pregnancy, with Report of Cases.**  
*Am. J. Obst.*, 1919, lxxx, 183.

Seventeen patients were treated, of whom twelve were benefited permanently and four only temporarily. The latter suffered a relapse because the quantity of corpus luteum given was not sufficient. There was one complete failure. In this case therapeutic abortion was done. The average number of doses was seven ampules containing 0.2 grams of corpus luteum.

E. L. CORNELL.

**Bernaldez, P.: Prolapse of the Uterus and Pregnancy** (Prolapso uterino y embarazo). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 70.

Bernaldez reports the case of a multipara who in her first parturition suffered a complete tear of the perineum but was not operated upon. Subsequently she was delivered twice. She consulted the author in her fourth pregnancy at which time she had a complete uterine prolapse. The entire uterus had prolapsed through the enormous rent, but the symptom of which most complaint was made was retention of urine. The bladder was emptied by catheterization but the lack of ligamentous and perineal support was so great that reduction of the uterus was impossible. As a result the cervix was ulcerated, bleeding, and purple.

The question of treatment was perplexing. To maintain the uterus in aseptic reduction by tamponade and permit the pregnancy to continue was impossible. To provoke an abortion might result in puerperal bacteremia with all its dangers. To perform a hysterectomy as for uterine myoma, ignoring the pregnancy, it would be necessary to use the abdominal route and this might be the cause of fatal peritonitis.

The patient aborted spontaneously, however, the day after having made a trip to a neighboring town and the author did not see her again. If she had returned he would have done a Wertheim-Schauta operation after the abortion which, according to Recasens, is the operation of choice for prolapsed uteri of great size. This he would have followed with a colpoperineorrhaphy.

M. M. MATTHIES.

**Cameron, M. H. V.: Glycosuria in Pregnancy.**  
*Canadian M. Ass. J.*, 1919, ix, 723.

The writer reports finding a reducing sugar in small amounts in the case of a patient in the fifth month of pregnancy. This disappeared entirely, however, after the sixth month and it was therefore decided that the condition was a transient lactosuria, a very ordinary concomitant of preg-

nancy which need give no further cause for anxiety. The confinement was tedious and nearly 2 ounces of chloroform were used. The puerperium was uneventful. Within a week from this time the patient developed an insatiable appetite and three weeks later died of diabetic coma in spite of vigorous treatment.

Since the case reported the author has had 468 obstetrical cases in 4 of which there was glycosuria. Undoubtedly both lactose and glucose may appear in the urine with no more significance than that there is normal stimulation of the mammary glands as they are being prepared for their function after the birth of the child and will disappear from the urine after lactation is established. However, while this simple explanation suffices in many cases, in many more it is inadequate. The excretion of sugar in any form or amount is a matter of derangement in metabolism that is complex, and when the further derangement of pregnancy is added, the complexity is vastly increased.

In 469 cases of pregnancy 5 cases of glycosuria have been found. In 4 cases the sugar was definitely identified as glucose by either fermentation or osazone tests. The other patient died of diabetes. The inference is obvious. The finding of a reducing sugar in the urine of a pregnant woman is a serious matter. Lactosuria may be a trivial affair, but before a patient whose urine reduces copper hydroxide in a test solution is dismissed as not being in a serious condition, the fullest tests should be made to determine whether lactosuria is the real condition or not. When there is glycosuria true diabetes may be about to manifest itself or may be already present. Those cases in which sugar appears in the urine during pregnancy and disappears from the urine when the pregnancy is ended require merely careful management. A more or less strict regulation of diet will keep the symptom in abeyance. A careful selection of the anæsthetic to be used and any means to lessen the shock of delivery will perhaps prevent the onset of such changes in the endocrine system as are indicated by the glycosuria and might result in diabetes.

The diagnosis of true diabetes is of supreme importance should the glycosuria be controllable by regulation of the diet. The frequent examination of the urine may suffice to protect the patient during gestation but the only means of arriving at definite conclusions is by estimating the sugar in the blood. The method is simple with a proper colorimeter. Whenever sugar appears in the urine the presence or absence of a hyperglycemia should be determined. Ingestion tests of the carbohydrate tolerance are difficult to carry out and may be most disagreeable to the patient.

H. K. GIBSON.



**Martínez de la Riva, A.: Statistics of Cæsarean Operations by Kroenig's Method** (Mi estadística de operaciones cesáreas por el proceder de Kroenig). *Med. Ibero*, 1919, Numero extraordinario, 1 Cong. nac. de med. y cirug., 70.

On the basis of his statistics the author draws the following conclusions:

1. The classical cæsarean operation should be replaced by the cervical cæsarean section. The latter is no more difficult and its advantages are much greater.
2. The latter may be performed safely also in the majority of cases of suspected infection.
3. In cases which are clearly infected, total hysterectomy should be done by the method advised by Recasens, if the indication is absolute. If the indication is relative, craniotomy should be considered.
4. Cæsarean section is very seldom contra-indicated even when the indication is not absolute.
5. In favorable circumstances the indications for cæsarean section should be judged very liberally.
6. It is only in the exceptional case that the patient does not consent to the operation and obstetricians should popularize its advantages.

M. M. MATTHIES.

**Candela Plá, M.: Placenta Prævia and Cæsarean Section** (Placenta previa y cesárea). *Med. Ibero*, 1919, Numero extraordinario, 1 Cong. nac. de med. y cirug., 70.

Some years ago at the last International Congress of Medicine held at Madrid Candela stated that certain cases of uncontrollable hæmorrhage from placenta prævia constitute definite indications for transperitoneal cæsarean section. This method was severely criticized but today is the accepted procedure in some of the schools of Spain and other European countries and in America.

As in some cases the transperitoneal route was not approved of by certain surgeons, the extra-peritoneal procedures were devised. These, however, were difficult to execute and in some instances required considerable time.

In favor of his contention the author cites fifteen cases in which only one woman died and the lives of all of the babies were saved. One of these he reports in greater detail. The patient had been bleeding at intervals for forty-eight hours and at the time of operation was almost moribund. In two or three minutes the abdominal incision was made, the fetus delivered alive, the placenta separated from the uterus, and the metrorrhagia stopped. The patient was discharged from the hospital with her child ten days later.

M. M. MATTHIES.

#### MISCELLANEOUS

**Davis, E. P.: Obstetrical Surgery.** *Am. J. Obst.*, 1919, lxxx, 122.

In his efforts to save life and preserve health, the obstetrician is contending against some of the most

important enemies which confront the surgeon. Hæmorrhage, shock, and infection threaten the surgeon and obstetrician equally. Parturition causes wounds so frequently that repair of such injuries introduces an element of surgical closure. It therefore follows that much of obstetrics is obstetrical surgery.

The most frequent of obstetrical operations is delivery by forceps. The introduction of any foreign body within the uterus, though it pass no further than the cervix or only into the vagina, exposes the patient to the risk of infection, while anæsthesia and manipulation give rise to the danger of relaxation of the uterus and hæmorrhage.

The indications for delivery by abdominal and vaginal section have been so greatly extended in recent years that a new field in experience and observation is being opened up.

In accidental separation of the normally implanted placenta, a condition analogous to that of ruptured tubal gestation is present. Here abdominal delivery affords the only prompt and secure method of rescuing the mother from insidious danger. While there is a difference of opinion concerning the treatment of placenta prævia, the majority of obstetricians agree that accidental separation of the normally implanted placenta in the later months of pregnancy is best treated by section.

Shall eclampsia be treated by section, abdominal or vaginal? The author has long since abandoned abdominal section for toxic patients suffering from convulsions except when the patient is a vigorous primipara with unshortened and undilated cervix who has had few convulsions and does not respond to eliminative treatment. In such cases prompt delivery by abdominal section may save the life of both the mother and the child. There is, however, a distinct field for elective abdominal section in the toxæmia of pregnancy. When hygienic measures fail in the later months of gestation, toxæmia steadily increases, there is no sign of labor, and active treatment of toxæmia fails to check its progress although the patient does not have any convulsions prompt delivery by section is indicated.

Surgery of the digestive tract in pregnancy is a modern field of great interest in obstetrics. Appendicitis complicating pregnancy is not an uncommon occurrence, and a careful study of considerable numbers of cases of cholecystitis in child-bearing women shows that this condition frequently arises during pregnancy. In a pregnant woman having an infected appendix an appendectomy should be performed as soon as the diagnosis is made, the earlier in pregnancy the better. Whether an infected gall-bladder should be drained during pregnancy or removed has not yet been clearly established.

In the pyelitis of pregnancy many cases are successfully managed by medicinal or local treatment, but in some instances the author has found that drainage of the kidney by incision is followed by good results. In none of these patients was



pregnancy interrupted, and in all cases a good recovery followed the operation.

In rupture of the uterus and in pathologic conditions in the pelvis which render vaginal delivery impossible or unsafe abdominal section is often indicated.

EDWARD L. CORNELL.

**Reeves, E. A.: A Study of 750 Obstetrical Cases in Private Practice.** *J. Kansas M. Soc.*, 1919, xix, 177.

The writer presents statistical data obtained from 750 cases occurring in private obstetrical work. Thirty-two per cent of the patients were primiparæ. The presentations as noted in the first or second stage were as follows: occipito-anterior, 601 (92 per cent); occipitoposterior, 19 (2¾ per cent); face, 1 (1/6 of 1 per cent); transverse, 13 (2 per cent); and breech, 26 (3½ per cent). Forceps were applied in 88 cases (11⅓ per cent). Fifty-eight of the forceps deliveries were those of primiparæ.

Version was necessary in 23 cases (3 per cent) and was always done for occipitoposterior or transverse presentation or eclampsia. The author considers version at the proper time safer and easier than the use of high forceps. No cesarean sections were performed in the series although in the author's opinion section would have been preferable in 3 cases, in 2 of which version was done and in 1 of which the forceps were used. These 3 mothers survived but the babies were lost. Five of the patients in the series had eclampsia which in 2 cases was fatal. All of the babies in these cases survived. One patient, a primipara 29 years of age, had inversion of the uterus two hours after forceps delivery.

Mammary abscess occurred in 5 cases and in all developed after the patients, who were primiparæ, had left the author's care. Puerperal sepsis occurred in 3 cases. In 1 the infection was due to the dirty hands of a drunken husband and terminated fatally. The second case was attributed to unclean pads, and the third followed version for an impacted breech presentation.

Fibroids complicated labor in 2 cases. In 1 they resulted in the forceps delivery of a macerated foetus and subsequent hysterectomy, and in the second were the cause of severe postpartum hæmorrhage from inability of the uterus to contract. Premature detachment of the placenta occurred in 2 cases and both babies were lost. Two young primiparæ died soon after delivery, 1 two hours after an easy forceps delivery without severe hæmorrhage. A postmortem examination did not reveal the cause of death.

Postpartum hæmorrhage occurred in 4 cases of the series—1 case of uterine inertia in a primipara following the birth of twins, 1 case of uterine fibroids, 1 case of retained adherent placenta, and 1 case of inertia after forceps delivery of a primipara.

There were 11 pairs of twins and 1 set of triplets in the series. Only 8 (½ per cent) of the mothers were unable to nurse their babies.

The author used pituitrin in 78 cases, in 2 of which

there was an hour-glass contraction of the uterus with retained placenta. He is convinced that in reduced dosage, 5 to 7 minims, pituitrin is a safe and efficient adjunct.

H. K. GIBSON.

**Avellán, E.: The Value of Bone Grafts in Cases of Contracted Pelvis** (De la utilidad del injerto óseo en las estenosis pélvicas). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 64.

Sufficient proof of the practicability of bone grafting has already been obtained both clinically and experimentally.

The permanent widening of a contracted pelvis by means of a graft should be called "pelvioplasty."

Antedating the author's operation of pelvioplasty, although unknown to him at the time he originated it, were the tentative procedures of Phenomenof, Kotschecoff, and Frank. The last-named implanted a symphyseal graft successfully.

Pelvioplasty is indicated in cases of moderate contraction of the pelvis with a conjugata vera of 7 or 8 centimeters, cases which hitherto have justified pelviotomy. It should be performed also when the conjugata vera is less than 7 but more than 6 centimeters. Only future results will tell whether or not this operation is desirable also when the contraction is more marked and whether its benefits are increased when it is performed on both sides.

Pelvioplasty is simple and is easily executed with instruments in common use. The steps are as follows:

Pubiotomy. While an assistant watches the delivery of the child and, if necessary, gives an injection of pituitrin, the surgeon resects a piece of rib somewhat larger than the interfragmentary separation. After the child is born, this graft is implanted and the wound sutured. Immobilization is obtained by means of a plaster cast from the umbilicus to the malleoli which fixes the muscles in flexion with the legs separated and rotated outward.

M. M. MATTHIES.

**Slemons, J. M.: The Nutrition of the Fœtus.** *Am. J. Obst.*, 1919, lxxx, 194.

The equality of the non-protein nitrogen in maternal and foetal blood indicates that its various constituents, belonging in part to the class of foods and in part to the class of waste products, pass freely through the placental partition. There is evidence of a regulatory mechanism which maintains the same concentration of non-protein nitrogen in the two circulations. Such a similarity of concentration is explained by simple diffusion.

At present there is not the slightest excuse for assuming that the placenta synthesizes protein for the foetus. This function the foetal tissues perform for themselves. The requisite material is available in the foetal blood, having been acquired from the blood of the mother.

An excess of amino acids amounting to 2 milligrams of nitrogen appears uniformly in favor of the



fœtal plasma. Small as it is, such a difference in concentration implies the addition of some process to that of simple diffusion in the regulatory mechanism of the placenta. While equilibrium between maternal and fœtal blood is obtained with only a slight difference between the concentrations of amino acids in the two circulations, the results indicate that the placenta absorbs these substances and also prevents their departure from the fœtal circulation.

The placenta takes no active part in the elimination of fœtal urea and behaves as a semi-permeable membrane. Ammonia as well as urea passes through the placenta by diffusion.

The mean glucose value for the mother was found to be 0.132 per cent, while that for the fœtus was 0.115 per cent. Slightly higher values occurred in the maternal blood in 19 out of 24 cases, while in 5 cases the values were identical in both circulations. These facts do not support a hypothesis requiring the action of an enzyme. In a case of double-ovum twins, in which each fœtus had its own placenta, the blood-sugar of one was 0.099 per cent and that of the other 0.096 per cent, while that of the mother was 0.12 per cent. Such findings are inexplicable except on the basis of diffusion through the placenta. Slightly higher maternal values promote a steady flow of glucose toward the fœtus.

Fats and lipoids are more abundant in the maternal blood and relatively large maternal values have large fœtal values associated with them. In the plasma the disparity is equally obvious. Either

the fats and lipoids cross the placenta with the aid of an enzyme or they do not cross at all. The latter interpretation is correct. The fat in the body of the fœtus is manufactured there, and almost certainly manufactured from carbohydrate.

EDWARD L. CORNELL.

**Talbot, F. B.: The Analysis of Human Milk: Technique of Obtaining Samples and Interpretation of Results.** *J. Am. M. Ass.*, 1919, lxxiii, 662.

One source of error is the method of obtaining the sample for examination. In order that a sample may represent the true composition of the milk, it must be obtained in one of two ways. According to the first method, all the milk is drawn or expressed from one breast and sent either in bulk or in mixed sample to the chemist. According to the second method, which is much more simple, it is necessary only to obtain 1 ounce of milk before nursing and 1 ounce after nursing. These 2 ounces may then be analyzed separately or mixed together. If analyzed separately they must be averaged as the percentage of fat is much lower at the beginning than at the end of nursing, the difference occasionally being as much as 10 per cent.

The time of day that the milk is drawn also has an influence on the composition of the milk.

Accurate methods of chemical analysis must be used. Clinical laboratory tests cannot be depended upon because of their inaccuracies.

EDWARD L. CORNELL.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Herman, L.: The Diagnosis and Treatment of Unilateral Renal Tuberculosis.** *Ann. Surg.*, 1919, lxx, 203.

The term "primary renal tuberculosis" is used by the author only with reference to the site of the initial appearance of the tuberculosis in the urogenital system.

Tuberculosis is primary in the urinary tract when it occurs in the kidney. In this location the bacilli find favorable conditions. From here the infection spreads to the tissues along the course of, and connected with, the ureter. A multiplicity of infections in the epididymis and the kidney make the prognosis less favorable.

The author emphasizes the point that tuberculosis of the kidney is apt to remain localized in the upper urinary tract for a considerable period of time but finally spreads to the bladder and then involves the other kidney. He quotes a series of 64 cases complicated by involvement of the bladder in which only 19 of the patients remained well after nephrectomy as compared with 100 per cent of cures obtained in a series of 34 cases in which the disease was limited to the kidney which was removed. As a rule the ureter should not be removed except under the following conditions:

1. Cases in which the ureter is strictured below, dilated above, and secondarily infected.
2. Cases in which the ureter is dilated, infected, and in free communication with the bladder cavity.
3. Cases in which the ureter is enlarged, soft, and diffusely involved by subacute miliary tuberculosis.

The complete removal of ureters otherwise involved pathologically is, with certain exceptions, unnecessary. Except under the conditions mentioned, the ureter should either not be disturbed at all, or only such part of it should be removed as can be reached conveniently through the ordinary nephrectomy wound.

V. D. LESPINASSE.

**Lower, W. E.: Ureteral Transplantation in Inoperable Conditions of the Bladder.** *J. Am. M. Ass.*, 1919, lxxiii, 328.

For inoperable conditions of the bladder Lower advises the transplantation of the ureters into the large intestine rather than into the loin. He claims that the sphincter ani soon becomes adapted to the new condition and effectively controls the urine.

The operation is preferably performed in two stages, one ureter being transplanted first and sufficient time being allowed to pass before the transplantation of the second to be sure that it is functioning in its new location and to allow the sphincter ani to become adapted to its new condi-

tion. Preferably the right ureter is transplanted first for if adhesions follow, as they often do, the rectum becomes more or less fixed and cannot be so readily drawn into the cut.

In certain cases the patient's comfort may be still more increased and his life materially lengthened by removing the entire bladder at a third operation.

I. S. KOLL.

**Eisendrath, D. N.: Indications for Operation in Ureteral Calculi.** *Ann. Surg.*, 1919, lxx, 192.

Experience has shown that there are many other causes for the symptoms formerly regarded as pathognomonic of ureteral calculus. Moreover, many ureteral calculi belong to the latent group which give rise to symptoms only when infection of the kidney supervenes. In addition, there are many extra-ureteral shadows which may deceive even the trained eye as regards the size, form, and position of a true intra-ureteral calculus. The author outlines the sequelæ of ureteral calculus as follows:

In the ureter: (1) uniform dilatation above the calculus; (2) stricture at the point of impaction; and (3) peri-ureteral abscess.

In the kidney: (1) pyelonephritis; (2) infected or non-infected hydronephrosis; (3) perinephritic abscess; (4) calculus anuria; and (5) generalized sepsis (bacteræmia).

At the present time operation is not justified in a case of ureteral calculus, especially if the stone lies in the pelvic portion of the ureter, until repeated attempts have been made to deliver it by one of the manipulative methods so familiar to urologists.

If a slight renal infection is present, one or more efforts may be made to dislodge and deliver the calculus. If there is much fever, however, operation is indicated at once. The methods are enumerated as follows:

1. Injection of 2 per cent papaverin alone.
2. Injection of 30 cubic centimeters of albolene, glycerine, or olive oil.
3. Injection of 1 and 2 combined.
4. The use of the Lespinasse laminaria tent.
5. If the stone is lodged in the intraparietal portion of the ureter the use of the Bransford Lewis or similar dilators and forceps, even if it is necessary to incise the mucosa of the ureteral orifice when a calculus presents at the vesical end of the ureter.

The author quotes many interesting clinical cases showing the different types of infection due primarily to retention of urine by ureteral stone. He emphasizes the point that these acute infected cases should be treated by open operation rather than by intra-ureteral methods except in the occasional instance when the abscess may be drained by means of a catheter through the ureter. Cases of anuria due to



calculus must be treated by open operation unless the cystoscopic delivery of the stone is immediately successful. As the period of tolerance is from six to eight days, cystoscopic treatment may be used for from two to three days. If this is not successful, immediate operation should be performed.

Cases of bilateral ureteral calculi should be treated according to the general indications. If the urine is passing the stones it is justifiable to persist in cystoscopic methods. If no urine is passing the stones or if infection is present an operation is indicated.

V. D. LESPINASSE.

### BLADDER, URETHRA, AND PENIS

**Kolischer, G., and Eisenstaedt, J. S.: Tumors of the Urinary Bladder.** *Surg. Clin. Chicago*, 1919, iii, 531.

The authors present four cases of tumor of the bladder in one of which the tumor was benign and in three malignant. The symptoms are mentioned briefly, the course of the disease is traced, and the cystoscopic appearance in each case discussed in detail.

In the treatment of benign growths the advantages of fulguration over a cutting operation are pointed out. Like that of malignant disease of the viscera in general, the treatment of malignant neoplasms of the bladder is most unsatisfactory. The majority of cases are inoperable when first seen. Radiotherapy is now more generally used. There is no primary mortality and a favorable percentage of clinical cures result. When immediate relief is urgent the bladder should be opened above the pubes. This secures drainage, allows control of hæmorrhage, and relieves the intolerable suffering so often accompanying advanced malignant disease. The exposed growth may then be attacked directly through the suprapubic opening by actual cautery or electric coagulation.

H. A. FOWLER.

**Pfahler, G. E.: The Injection of Air for the Roentgen Diagnosis of Tumors of the Bladder.** *Am. J. Roentgenol.*, 1919, vi, 371.

The injection of air into the bladder for diagnostic purposes, which has been done occasionally for a number of years, the author believes is a method worthy of more extended application. It may supplement findings derived from cystoscopy, or if the latter is impractical because of severe hæmorrhage, pain, inability to pass the cystoscope, objection on the part of the patient, or the lack of a skilled cystoscopist, it may replace the cystoscopic examination. The technique used is described and attention is called to its simplicity and harmlessness. The field of usefulness of the method includes the demonstration of new growths, enlargement of the prostate, diverticula, and calculi. A number of cases are cited in detail in which its value was demonstrated. In conclusion the author states:

1. Injection of the bladder with air is practical and with proper precaution is harmless.

2. Tumors may be definitely outlined, and when judged by their size, shape, and position, in conjunction with the clinical history, a diagnosis as to their nature can be made.

3. This method will at times replace a cystoscopic examination; at other times it can be used to advantage in addition to the cystoscopic examination.

4. Injection of air into the bladder may be done when a cystoscopic examination is impractical.

5. The method described is less painful and generally less objectionable to the patient than the cystoscopic examination, and can be carried out wherever there is an expert roentgenologist.

ADOLPH HARTUNG.

**Jeck, H. S.: Apparent Cure of Carcinoma of the Bladder by Radium.** *Internat. J. Surg.*, 1919, xxxii, 240.

The patient, a married woman, 55 years of age, complained chiefly of hæmaturia which had continued for four months. There was no marked frequency of urination. Cystoscopic examination revealed the presence in the bladder of a red papillary growth, sloughy in parts, resembling and about the size of a raspberry, and situated near the left ureteral orifice. A section of the growth removed by means of an operating cystoscopic forceps and examined microscopically showed it to be a squamous-celled epithelioma. No induration could be made out by vaginal examination.

On July 9, 1918, two tubes of radium emanations of 31 and 37 millicuries were introduced into the bladder by way of the urethra and left in place for seven hours (476 millicurie hours). The radium was screened with silver  $\frac{1}{2}$  millimeter in thickness. About a week later there was a slight increase in frequency of urination which probably was due to a radium burn.

A cystoscopic examination made August 6, 1918, showed no change in the appearance of the growth. A tube of 40 millicuries was then introduced into the bladder with the intention of leaving it in place for ten hours but it was expelled spontaneously at the end of seven hours. Two weeks later the hæmaturia stopped. A month later there was scarcely any frequency of urination.

Another cystoscopic examination made September 24, 1918, revealed only a slightly raised area of inflammation about the size of a nickel. The patient's condition was nearly the same except that there was a slight hæmaturia. On November 19, 1918, another cystoscopic examination showed at the site of the original tumor an elongated, sloughy growth about twice the size of the index finger. Radium was therefore applied again—two tubes of 70 millicuries each for five hours (700 millicurie hours). Both tubes were placed in immediate contact with the growth by the aid of the cystoscope. In three or four days the frequency increased to the extent that urination occurred every two hours by day and twice at night. The hæmaturia, however, ceased completely and has not re-appeared.



On January 28, 1919, cystoscopic examination showed a reddish area about the size of a dime at the site of the original tumor. Frequency of urination was almost normal. On March 18, 1919, the bladder was found to be entirely clean, there being no sign of tumor. On April 8, 1919, the bladder was still clean and the patient's weight was 109 pounds as compared with 85 pounds at the beginning of treatment.

The last cystoscopic examination, which was done May 13, 1919, still showed entire absence of the tumor and an apparently normal bladder mucosa. The patient complained of slight burning on urination but there was no frequency. Her appetite was good and she stated that she was feeling very well.

**Powell, W. W.: The Treatment of Chronic Urethritis: With a Description of a New Instrument for Cauterizing the Lacunæ.** *British M. J.*, 1919, ii, 161.

This article deals with the treatment of the penile portion of the urethra. The author emphasizes the frequency of cellular deposits from the mucous membrane in all inflammatory processes and their tendency to recent fibrous-tissue formation and states that in the treatment of urethritis the passage of sounds is too often neglected.

The passage of sounds should be undertaken as a matter of routine when the subacute stage is reached. If a discharge persists following this procedure, Powell believes it due to the persistence of the infection in the lacunæ. He therefore has devised a sheath to fit into the wall of an air urethroscope through which a probe can be passed. By means of this instrument the lacunæ may be cauterized individually, either by coating the probe with silver nitrate or by means of a fulgurating wire. The thorough cauterization of such multiple foci results in the diminution and suppression of the chronic discharge, providing the prostate has not become involved.

The altered condition of the lacunæ produced by the cauterization is similar to the inflammatory dilatation seen in old healed cases in which the lacunæ resemble shallow pouches.

In the author's opinion the rapidity and ease with which re-infected gonorrhoeal cases are often cured is due to the inability of the gonococci to become lodged in the altered lacunæ. H. C. BUMPUS.

#### GENITAL ORGANS

**Ochsner, A. J.: Prostatectomy Combining the Advantages of the Suprapubic and Perineal Methods Usually Employed.** *Surg., Gynec. & Obst.*, 1919, xxix, 84.

Ochsner has employed the following method in a large number of cases and contends that it has all the advantages and none of the disadvantages of the two methods usually employed.

The patient is given a hypodermic of  $\frac{1}{4}$  grain of morphine and 1/100 grain of atropine half an hour before the ether is administered by the drop

method. Everything is in readiness so that no time whatever is lost from the beginning of the anæsthesia to the end of the operation.

The bladder is irrigated with permanganate of potash solution, a sufficient amount being left in it to distend it moderately but not sufficient to cause a rupture. The patient is then placed in the lithotomy position and a grooved sound introduced into the urethra down to the perineum. An incision is then made corresponding to the lateral incision formerly made in the operation of perineal lithotomy, extending from a point halfway between the scrotum and anus to a point halfway between the left tuber ischii and the anus and extending down into the membranous urethra which is opened at this point sufficiently to admit the point of an old-fashioned lithotomy knife. The sound, together with the lithotomy knife, are then passed into the bladder, care being taken to carry the sound along the pubic bone in order to prevent the knife from cutting into the rectum, thus splitting the membranous and prostatic urethra posteriorly. The knife is then withdrawn and the operator's finger is carried through the incision along the sound into the bladder.

The finger is then precisely in the same position that it would be if a suprapubic opening had been made, and in this fact lies the important advantage of the method described over other methods of operation because, beginning from above and entering the capsule of the prostate gland through the urethra, the surgeon is in a position to enucleate the prostate precisely as though the bladder were entered from above through the usual suprapubic incision and the prostate gland were to be enucleated according to the Freyer method.

This step of the operation should be carried out with the utmost care in order not to disturb the bladder or urethra unduly. If bands of adhesions are encountered they should be cut by means of a pair of blunt curved scissors carried along with the finger. Presently the entire gland is free from its attachments to the urethra and the capsule is withdrawn through the perineal incision by means of Young's forceps. The area is then carefully explored with the finger. Occasionally an additional lobule of prostatic tissue is found which must be enucleated.

The index finger of the left hand is then introduced into the neck of the bladder and the capsule of the prostate caught by means of fine-toothed forceps, one being applied to the right and one to the left. A drainage tube consisting of an inner tube 1 centimeter in diameter and covered in its middle portion by a second rubber drainage tube just large enough to slip over the first one, is then introduced, the inner tube extending into the bladder, and the outer tube into the capsule.

Ferguson's retractors are then applied to each side. The capsule is held in position by means of the fine-toothed forceps, and gauze is packed around the rubber tube into the capsule. The double tube



prevents collapse and offers a sufficient amount of resistance to make the tamponing effective for controlling the hæmorrhage.

The rubber tube is held in place by means of silk-worm gut sutures which pass through the edge of the wound and the outer rubber tube.

H. W. E. WALTHER.

**Guiard, F. P.: Puncture Followed by Injections of Van Swieten's Fluid Combined with External Massage for the Radical Cure of Vaginal Hydrocele, Etc.** (Ponction suivie d'injections de liqueur de Van Swieten combinées avec des malaxations externes pour la cure radicale de l'hydrocèle vaginale, etc.). *J. d'urol. méd. et chir.*, 1919, viii, 53.

Puncture with a trocar of sufficient caliber followed by repeated injections of Van Swieten's fluid and external massage is an extremely simple method of treatment within the ability of all practitioners, even those little experienced in surgery, and is of remarkable value in various affections of the urogenital and other organs. It is a method, also, which is available when surgical incision or radical operations are contra-indicated.

In vaginal hydrocele the classical method of treatment with injections of tincture of iodine very frequently provokes an inflammatory reaction which is often severe and prolonged. Such results do not follow the injection of Van Swieten's fluid.

The author uses a No. 9 Charrière trocar which is 3 millimeters in diameter. The serosa is then anæsthetized with cocaine solution and the Van Swieten fluid injected. In the majority of cases the reaction is very slight. About 20 cubic centimeters are injected into the serous cavity and while it is retained for a few minutes the testicle is massaged, after which the fluid is allowed to run out. This is repeated several times. The dosage of sublimate represents only what can usually be absorbed within twenty-four hours without causing a mercurial stomatitis.

The inflammatory reaction provoked, which is unavoidable in the radical treatment, is soon made apparent by the re-accumulation of the effusion.

This attains its maximum by the second or third day and usually is accompanied by only very slight pain. Toward the tenth or twelfth day resorption begins and is completed within a few weeks. Long before this, however, the patient is up and about and considers himself cured.

The author treats prostatic abscess, suppurative Bartholinitis, and ganglion abscesses in a similar manner.

W. A. BRENNAN.

**Finochietto, R.: Varicocele (Varicocele).** *Semana méd.*, 1919, xxvi, 559.

Finochietto has made a study of the various types of varicocele and the surgical methods applied in their treatment. He finds that the known surgical methods cure the majority of cases without producing complications. Complications may be expected:

1. From any operation which does not primarily act against reflux.
2. From any operation which destroys the spermatic artery without previous proof of the existence and sufficiency of collateral circulation.
3. From any ligature placed upon veins of the anterior packet without previous dissection and separation of the spermatic artery.
4. From any venous ligature placed in the vicinity of the testicle by which thrombosis and its consequences may be produced.
5. From any operation sacrificing dilated veins merely because they are dilated and without first verifying the facts regarding reflux.

The author considers dissection of the spermatic artery with transparietal transplantation of the anterior packet of veins alone (the method of Del Valle) the ideal operative method but impracticable. In actual practice the best method is high separation of the spermatic artery, resection of the veins which accompany it, and transparietal transplantation of the anterior packet.

Varicocele has been attributed to rupture but in the author's opinion a clearer conception of the condition would prove that this is not a cause.

W. A. BRENNAN.



# SURGERY OF THE EYE AND EAR

## EYE

**Hansell, H. F.:** Clinical and Pathological Report of a Case of Intra-Ocular Tumor. *N. York M. J.*, 1919, CX, 372.

Hansell reports a typical case of melanotic sarcoma and discusses the relative importance of retinal detachment, increased tension, and the shadow seen on transillumination. This case was under his observation in the hospital for six months, during all of which time transillumination indicated the presence of a tumor within the vitreous chamber. The eye was not enucleated until the ciliary injection became prominent. In this connection the author states that it is impossible to tell a malignant from a non-malignant intra-ocular tumor until after enucleation unless the growth is rapid and causes perforation of the coats of the ball. T. D. ALLEN.

**Connor, A. B.:** Congenital Choroideremia. *Am. J. Ophthalm.*, 1919, II, 553.

Connor reports a case of absence of the entire choroid except in the macular area. The patient was a strong, well developed soldier, 25 years of age, who complained that he could not see to get about at night. This condition had existed as long as he could remember. Vision in daylight was normal, but after dark was so much reduced that while on guard duty at night he failed to recognize and salute an officer. The vision of each eye was 20/20. His personal history was negative except for an attack of measles of less than average severity at the age of 6 or 7 years. His family history was also negative.

The external structures of both eyes were normal. Ophthalmoscopic examination showed normal clear refracting media, but instead of the normal red reflex there was a glistening white fundus over which the larger retinal vessels appeared about normal in size and distribution. The sclera was exposed to view over the entire fundus except a circular area about twice the size of the disc in the macular region, the fundus there having the normal yellowish-red color. Both eyes were affected in the same way and presented practically the same ophthalmoscopic picture except that the left macular area was less regular in outline than the right. The latter had choroidal vessels extending out from it toward the disc and below. Although the retinal vessels appeared entirely normal, the retina itself was not normally developed over the white area, as shown by the markedly contracted form and color visual fields, and this was the explanation of the nyctalopia.

The only allusion to this condition which the author was able to find in the literature was that of Nettleship. According to Lang, colobomata of the

choroid are due to adhesions between the blastodermic membranes, and it is certainly true that these defects usually occur along the line of the optic cleft and correspond to the general shape of the cleft during the various stages of its closure. The lesion in choroideremia differs widely in location and extent from coloboma of the choroid; in macular coloboma there is an absence of the choroid in the region of the macula, while in choroideremia the opposite obtains, the macular area being the only part of the fundus which is supplied with choroid.

The structure in embryonic life from which later the macular area of the fundus is derived is a spot on the outer surface of the secondary optic vesicle where the first signs of differentiation of the mesoblast into sclera and choroid are seen, the first appearance of the choroid being manifested by a tiny plexus of capillaries at this point. Hence, in seeking an explanation of the cause of choroideremia, we must consider that differentiation of the mesoblast of the secondary optic vesicle into sclera and choroid began in a normal way and at the normal point, but for some reason was arrested when only the macular area was supplied with choroid.

W. F. MONCREIFF.

**Moore, R. W.:** Hypopyon. *Texas State J. M.*, 1919, XV, 156.

After a preliminary discussion of the theories and causes of hypopyon the author reviews a case in which there was also a double chronic dacryocystitis. This patient had several serpiginous ulcers during a period of seven years. The last one was very grave and did not yield to the usual cauterization or other vigorous treatment. Following the intra-orbital injection of a 1:1000 solution of cyanide of mercury, however, relief from the pain was noticeable the same day and two days later the ulcer began to clear.

T. D. ALLEN.

**Lister, A. E. J.:** Some Points of Practical Importance in the Operation of Sclerocorneal Trephining by Elliot's Method. *Indian M. Gaz.*, 1919, LIV, 294.

Emphasis is placed on the importance of raising the flap preparatory to trephining and including all of the superficial tissues in one layer. This is done more easily with the points of the scissors than in any other way. It reduces hemorrhage and tends to lessen the chance of late infection.

Lister prefers a trephine of  $1\frac{1}{2}$  millimeters rather than the trephine of 2 millimeters which is recommended by Elliot. The larger instrument decreases the strength of the sclera and the huge filtering scar is more apt to cause irritation, continual lachrymation, and probably also late infection.



If an assistant first steadies the eye by fixing the eyeball with fixation forceps applied below the center of the cornea and the operator then further steadies it by grasping the outer edge of the sclera exposed in the flap, the trephine will cut much more quickly and cleanly. If, in addition, a third person steadies the head, the patient has little opportunity to move his head or eye during the operation. With the patient thus steadied Lister finds that it is possible to perform the iridectomy more neatly if he removes the trephine disc first.

As regards the danger of leaving blood in the anterior chamber, attention is called to the fine deposit of disintegrated hæmoglobin sometimes seen on the front of the lens. To avoid this Lister waits a short time after doing the iridectomy before replacing the flap. If there is only a little blood in the anterior chamber he leaves it as in most cases it speedily clears up. He believes it is a mistake to massage the blood out because in so doing the aqueous is expelled and if the bleeding has not ceased in the region of the trephine hole, the cornea exerts suction when it resumes its shape and the entire anterior chamber may be filled. If it is necessary to remove the blood he irrigates the anterior chamber.

In Lister's opinion the introduction into the anterior chamber of a fluid the composition of which can be only approximately that of the normal aqueous, is not a desirable proceeding.

If the scleral disc falls into the anterior chamber it should be removed by means of the Hess iris forceps, a very delicate instrument with a shoulder. If this is not successful, irrigation should be done.

A pre-operative injection of hyoscine and morphine is of great value; practically all of the author's patients are very nervous. Nausea and vomiting are often prevented by not giving anything to drink for a number of hours afterward. As a general anæsthetic chloroform is recommended.

T. D. ALLEN.

**Barraquer y Barraquer, I.: Criticism of Modern Methods of Cataract Extraction** (Crítica de los métodos modernos de extracción de la catarata). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 91.

In addition to the usual pre-operative preparation, the eyelids should be washed with soap and water and 4 per cent silver nitrate solution. The surgeon should wear sterilized cotton gloves.

Fixation is obtained with Desmarre's elevator and Landolt's forceps. This is loosed when the flap is cut.

The suturing is most important. The conjunctival flap is a part of the process, the bridge which leads to it.

Iridectomy should be avoided, but if it is believed necessary, it should be peripheral.

Care should be taken to prevent interposition between the edges of the wound and a graduated miosis.

The dressing must be limited to the operative region.

In order to prevent the entrance of bacteria which might be brought into the wound by the eye-lashes during the period of healing, sublimate salve should be applied to the eyelids.

M. M. MATTHIES.

**Castresana, B.: The New Suction Method for the Extraction of Cataract** (Del nuevo procedimiento de la ventosa para la extracción de la catarata). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 100.

The operative technique which should be used for the extraction of cataract is a most important problem and has been the subject of much discussion. The extraction of the cataract *in toto* was practised before the use of the suction method but because of the great loss of vitreous this procedure was abandoned. Likewise the English method of suction did not completely meet expectations. The latter, however, is less violent and in the author's opinion more beneficial than the former because it produces less trauma and incipient and incomplete cataracts may be operated upon in this way without the formation of secondary opacities.

Occasionally, however, the suction method may be followed by iritis though this is rare. Another disadvantage is that the flap which is cut for operating is larger than usual with the ordinary procedures as the instrument used occupies more space, and this retards the cicatrization of the wound. Moreover, the suction being localized in the pupillary field and applied over the anterior crystalline lens, it is difficult to withdraw it rapidly if the patient becomes restless and there is risk of causing complete luxation of the lens. The operation may be complicated also by the interposition between the edges of the wound of small capsular laminae or the fibers of the zonule which emerge upon the withdrawal of the cataract. Another fault of the method is that it does not obviate the loss of vitreous humor, though such loss is infrequent when the operator is skillful.

Notwithstanding the disadvantages enumerated, however, Castresana believes that the suction method should be tried out clinically to determine its indications.

M. M. MATTHIES.

**Lloyd, R. I.: Locations of Trephine Opening in Glaucoma after Cataract Extraction.** *Am. J. Ophth.*, 1919, ii, 601.

This is a report of a case of preliminary iridectomy, Smith-Fisher intracapsular extraction, acute glaucoma, posterior sclerotomy, corneoscleral trephination in the area of iridectomy, corneoscleral trephination at the opposite side of the cornea, iridotomy, and final vision of 15/30, tension 23.5 millimeters (Schiotz). The interesting point seems to be that the Elliot operation was followed by lowered tension after the second and not after the first operation. Lloyd believes this was due to the fact that the iris held back the vitreous which after the first operation



crowded forward into the wound and thus defeated the purpose of the drainage. He calls our attention to the necessity for taking tension before cataract extraction by mentioning the fact that glaucoma may be one cause of delayed union following such extraction.

T. D. ALLEN.

**Huizinga, J. G.: A New Suture in Advancement for Strabismus.** *Am. J. Ophthalm.*, 1919, ii, 606.

In order to prevent the sutures from cutting through the muscle in advancement operations for strabismus, the author suggests that after the tendon has been severed close to its insertion, it should be folded back on itself beneath the muscle and held there by a suture, thus forming a loop at the end of the muscle. A thread passed through this loop should then be sutured to the tendon stump and sclera in the usual way.

T. D. ALLEN.

**Garcia del Mazo, J.: Extirpation of the Lachrymal Sac** (La extirpación del saco lagrimal). *Med. Ibera*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 97.

Affections of the lachrymal passages occupy an important place in ophthalmological practice not only because of their frequency, but also because of their resistance to medical treatment and the associated danger to the eyeball.

Garcia has done 240 extirpations of the lachrymal sac according to a method of his own which he has reported previously; 195 in women and 45 in men; 129 in the left eye and 111 in the right. The youngest patient was 11 years of age and the eldest 78. In 24 cases the extirpation was bilateral.

The difficulties of the operation depend upon hæmorrhage, adhesions, friability of the walls of the sac, fistulæ, old recurrent inflammations, and the anatomy of the region. The latter must be known in detail in order to use the method successfully.

If the technique is imperfect a piece of the lachrymal sac is apt to be left, causing infection and obstruction of the duct.

Care must be taken to avoid perforating the orbital septum as this would give rise to infection of the orbital cellular tissue with its grave consequences.

In the 240 cases the dacryocystitis was of the following types: simple, suppurative, 38; with ectasis of the lachrymal sac, 100; encysted or with mucocoele, 18; fistulous, 31; acute and subacute, 15; with ulcer and hypopyon, 7; with leucoma (operated upon by iridectomy and extirpation of the lachrymal sac), 2; and with cataract (operated upon by cataract extraction and extirpation of the lachrymal sac), 29.

The results obtained demonstrated that extirpation of the lachrymal sac is a procedure much superior to any other known method and leads to the radical cure of the various forms of dacryocystitis. Its principal advantages are summed up as follows:

1. There is absolute certainty that all of the diseased tissue will be removed.

2. Cure is obtained quickly as even in the worst cases it required not more than fifteen days. Cauter-

ization incapacitates the patient for from forty to fifty days or even longer.

3. The operation is not painful.

4. The cicatrix is not visible a month later.

5. In patients who have had operations upon the eyeball, cataract extractions or iridectomy, the cure is on the whole perhaps better than in those who are more nearly normal.

6. The effect of the operation on keratitis with hypopyon is notable; the condition is cured and no trace of it remains.

7. In the majority of cases there is no lachrymation.

In the author's opinion those who at present have no confidence in the method will become its most enthusiastic advocates after they have become convinced of its efficacy.

M. M. MATTHIES.

**Holmes, C. R.: Extirpation of the Lachrymal Gland for the Relief of Epiphora.** *Arch. Ophthalm.*, 1919, xlviii, 323.

Removal of the lachrymal gland was early attempted by a few operators but later entirely abandoned, probably because of sepsis. It appears more rational to the writer to remove the main gland which secretes at least 90 per cent of the tears. An operation such as extirpation of the tear sac which does not remove the annoying lachrymal secretion he regards as a very incomplete piece of surgery.

The incision he uses is made just below the eyebrow and carried 3 millimeters below the outer canthus. The gland is described as of a delicate pinkish-yellow color not easily distinguishable from orbital fat. A thin but distinct layer of fascia lies between the superior and inferior gland. The tissue is friable and care must be used in dissecting it out in its entirety.

Severe hæmorrhage may occur although the author reports that he has never encountered it. In co-existent disease of the tear sac, the sac is excised, the field resterilized, and the lachrymal gland then removed at the same operation. The complete extirpation of the inferior gland is not easy as the gland is often nothing more than a varying number of minute aggregations of tissue irregularly scattered.

Ten cases extending over twenty years are reported. The results have been excellent.

S. S. HOWE.

**Castroviejo, R.: A Contribution to the Study of Mycotic Concretions of the Lachrymal Canaliculi** (Contribución al estudio de los concreciones micóticas de los canaliculos lagrimales). *Med. Ibera*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 94.

The formation of concretions in the lachrymal canaliculi is a rare condition and the case observed by the author is the first to be reported in Spain.

Localized in the majority of cases in the inferior canaliculus, the evolution of the affection is almost the same in every instance and is characterized by



slow development, chronicity, and little tendency to spread.

In one instance no parasitic agent was found to which it was possible to attribute the formation of the concretion, but those who have studied the condition are unanimous in regarding it as a mycosis. Two fungi of the same species (considered by some authors, however, as only one) have been found, i.e., the *discomyces bovis* or *actinomyces* and the *discomyces* or *streptothrix foersteri*.

The name "pseudactinomycosis" given by some authors to the affection produced by the *streptothrix foersteri*, Castroviejo believes should be abandoned and the term "streptothricosis," proposed by Axenfeld, substituted for it.

The mere presence of concretions is not sufficient to warrant a diagnosis of actinomycosis of the lachrymal ducts. Definite evidence of the condition is given only by microscopic examination. Cases in which the characteristic findings are not observed must be considered cases of streptothricosis.

The manner in which the contagion is spread is not evident. It is believed, however, that it takes place by means of vegetable rests, especially grasses, transported by the air or water to the conjunctiva, and that a series of changes in the mucosa and the caliber of the lachrymal duct are necessary before they can become attached.

The prognosis of the condition is very favorable. Cure results within a few days after incision of the canal and extraction of the concretion either by simple expression or by means of a curette. The spontaneous cure which, according to some authors, may occur by calcareous degeneration, Castroviejo does not consider a true cure as the concretions continue to act as foreign bodies and produce at least functional disturbances even if they do not give rise to inflammatory complications. M. M. MATTHIES.

#### EAR

**Lawrence, G. H.: Acute Suppurative Otitis Media.** *Wisconsin M. J.*, 1919, xviii, 95.

Lawrence emphasizes particularly the importance of preserving an aseptic condition of the meatus in otitis media so as to prevent a staphylococcus infection which nearly always results in chronicity. Dry treatment by means of a cotton-wrapped applicator and suction is preferable to irrigation treatment as the former is less apt to produce a secondary infection.

The practice of swabbing the nasopharynx in the acute infectious diseases is condemned as it causes gagging and forces the infected secretions up the eustachian tube. O. M. ROTT.

**Suñe y Medán, L.: The Indications for Mastoid Trephination** (Indicaciones de la trepanación mastoidea). *Rev. españ. de cirug.*, 1919, i, 303.

The surgeon should be prepared to open the mastoid cavity under the following circumstances:

1. When there is intense pain in the mastoid region (whether or not it radiates toward the neck or the occipital, frontal, temporal, or parietal regions) and especially when it does not yield to other means of treatment.

2. When there is very high and continued fever associated with chills.

3. When headache is generalized, very intense, and incessant, with predominance of the fronto-occipital type.

4. In cases in which there is facial or other cranial paralysis.

5. Cases of frequent nausea, vomiting, and repeated vertigo, stiffness of the neck, and sensory disturbances.

6. When auricular suppuration is very abundant and foetid and appears to be chronic.

7. When a cholesteatoma is found in the cavity.

8. When there is considerable stenosis of the external auditory canal.

9. When the multiple fungosities of the cavity and antrum quickly re-form after being destroyed and impede the discharge of pus.

10. When on simple cutaneousperiosteal incision of the mastoid region to evacuate an abscess extensive caries of the bone is found with the sound and it is not possible to obtain good drainage.

11. When an acute mastoiditis is suspected in the course of a chronic mastoiditis.

12. When the patient gives a personal or family history of tuberculosis.

13. When there is no amelioration of the more important symptoms at the end of six or eight weeks of conservative treatment. W. A. BRENNAN.

**Harris, T. J.: Severe and Uncontrollable Hemorrhage Following Mastoidectomy in a Patient Suffering from Purpura.** *N. York M. J.*, 1919, cx, 311.

In the case reported there was a constant oozing of blood for a little more than two weeks following the operation. During this period, 1,400 cubic centimeters of human blood were transfused. Locally coagulen oils and hæmoplastin were used. The latter apparently gave the best results but the bleeding was not controlled until the wound was sutured.

In commenting on this case Harris discusses the differences between hæmophilia and purpura. Hæmophilia is a hereditary disease characterized by a deficiency in one or more of the clotting properties of the blood which results in prolongation of the coagulation time. Purpura, representing many different conditions, is characterized by a deficiency of blood platelets. Hæmophilia is apt to occur in males, although it is transmitted through the female. Purpura occurs in both the male and the female. The bleeding in hæmophilia occurs usually after injury; that from purpura is apt to be spontaneous and is characterized by frequent subcutaneous hæmorrhages. In hæmophilia the amount of prothrombin is deficient, while in purpura it is normal.

In the case reported the purpura was of the hered-



itary type as two of the patient's brothers died from hæmorrhage. In other respects the features were those which are characteristic of purpura.

O. M. ROTT.

**Allen, B.: Mastoid Stereoroentgenograms Presenting Variations.** *Am. J. Roentgenol.*, 1919, vi, 385.

The objects of this paper are to outline two practical points relative to the roentgen examination and diagnosis of mastoid lesions illustrating the technique of making stereoroentgenograms of the right and left mastoid on a single pair of plates; to present a number of specimens in dried skulls from which the mastoid was dissected; and to offer a preliminary report on a number of patients demonstrating a variation of the mastoid cells, a condition which heretofore has been considered very rare.

The technique employed with a special plate-

changing device originated by the author is described in detail. Stereoroentgenograms give definite information relative to the condition of the mastoids and make possible early and accurate diagnoses. In slight or first degree mastoiditis a cloudiness or haziness of the cell spaces may be noted, whereas in severe or second degree involvement distinct changes in the bone structure are visible in addition.

The types of mastoid cells are spoken of as pneumatic and diploic. Usually the two sides are symmetrical. The author cites a case of a very rare condition in which the cells on one side were of the pneumatic variety and those on the other diploic. He also shows photographs of a specimen in which similar conditions obtained. In addition, the article contains plates illustrating lesser variations from the rule of symmetry in size, outline, and cellular consistency of the mastoids.

ADOLPH HARTUNG.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Mario de Gondra, D.: Congenital Choanal Occlusions** (Oclusiones coanales congénitas). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 109.

In the bony form of occlusion the author has been able to make out an atrophy of the inferior turbinate of the corresponding side, while in membranous occlusion there is hypertrophy.

Because of the nasal impermeability there may be, as in one of his cases of membranous occlusion, a venous stasis with extravasation of blood at the least touch or rubbing with the swab, even when the patient is not a hæmophilic. In this case also there was some disturbance of hearing due to tubotympanic catarrh from chronic pharyngitis acquired in the course of the infection.

As a rule the bony form of choanal occlusion should not be treated with the chisel and mallet as in the great majority of cases the obstructing diaphragm is extremely hard. Moreover, it is often impossible to perforate the obstruction with these instruments because of the arrangement of the bony masses which form one solid rock-like body with the ethmoid bone, the pterygoid process, the palatine arch, the vomer, and the maxilla. It is therefore evident that violent manipulation may have a fatal result. Trephination is the only practical method of treatment.

In cases of membranous occlusion the method used by the author is simple and has yielded excellent results, particularly in adults. After cocainization of the pharynx, nasopharynx, soft palate, and the anterior and posterior surfaces of the obstructing membrane, a central choanal opening is made by means of the galvanocautery by way of the nasopharynx.

The cautery is bent to follow the curvature of the cavity as it passes upward and as it is pushed forward is supported by the palate elevator. It is guided to the desired point with the aid of a rhinoscopic mirror of the largest size.

This procedure is preferable to every other method as the obstructing membrane can be seen in its entirety and the line or groove of its juncture with the choanal border is also plainly visible. It is along this line or groove that the end of the cautery must pass in order to destroy the obstructing membrane completely, leaving the choanal opening with normal dimensions.

By the anterior route, especially when there is some hypertrophy of the turbinate, it is nearly impossible to make a sufficiently large opening in the obstructing membrane.

M. M. MATTHIES.

**Botella, E.: An Original Procedure for Conservative Turbinectomy** (Sobre un procedimiento original de turbinectomía conservadora). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 106.

Hypertrophy of the inferior turbinate with consequent respiratory insufficiency and pharyngitis is extremely common. This hypertrophy may be soft, or of moderate consistency, or hard. The treatment usually employed is as follows: For the soft hypertrophy, extirpation of a quantity of tissue with the cold loop; for hypertrophy of moderate consistency, the use of the galvanic cautery; and for the hard hypertrophy, partial or total turbinectomy.

In every case a great quantity of mucosa is sacrificed and as a consequence crusts form which annoy the patient more than the respiratory difficulty of which he complained in the first place. Effort is made to avoid this inconvenience by the methods of Freer, Wurdeman, Watson, and Yankauer, but the technique of all of them is very difficult and requires a special instrument.

The procedure originated by Botella has the advantages of the methods named and its execution is extremely simple. It consists in resecting a wedge the whole length of the osseous portion of the hypertrophied turbinate as follows:

1. Anæsthesia is induced by the use of strips of gauze moistened with 10 per cent cocaine solution.
2. With a large Laurens forceps a wedge of bone is taken out longitudinally.
3. The flap which remains is held with a Péan forceps and drawn forward. The raw edges having been approximated, they are held in place by a strip of gauze and the superfluous portion of the flap is cut away.

M. M. MATTHIES.

**Casadesús, F.: My Method of Trephining Certain Types of Frontal Sinusitis** (Mi manual operatorio en la trepanación de ciertas formas de sinusitis frontales). *Med. Ibero*, 1919, Número extraordinario, 1 Cong. nac. de med. y cirug., 105.

In some cases of chronic suppurating frontal sinusitis the anterior frontal wall and the orbital border are affected with bone necrosis while all of the orbital vault which makes the floor of the frontal sinus remains normal or nearly normal.

In such cases it is not possible to follow Killian's method because it is necessary to resect the orbital border. Moreover, if the sinus is entered by way of the orbit (as is usually done) a true sinusectomy with its resulting deformity must be performed.

Casadesús prefers to do a partial or total ethmoidectomy by the external route in every case in which a radical operation upon the frontal sinus is necessary and at the same time preserve the æsthetic



appearance as much as possible. His method consists in entering the sinus anteriorly, taking advantage of the fact that in such cases there are many symptoms of necrosis of the frontal wall (blackish discoloration, parchment consistency, fistula, etc.) to resect all the anterior wall and all that is necessary of the orbital border without touching the healthy portion of the orbital vault. He then trephines the external part of the internal orbital process of the frontal bone to the frontonasal duct, transforming it into a canal and prolonging the trephination downward through the ascending process, etc., as is done by Killian's method of curetting the ethmoid. This having been done, the wound is sutured except in the external angle where the drainage tube is placed, or it is left open in the frontal portion according to the requirements of the particular case.

M. M. MATTHIES.

**Moore, I.: Recurring Sphenchoanal Polypus in a Child.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 104.

Moore describes a recurring sphenchoanal polypus in a child 8 years of age. Two years previously a postnasal polypus which was microscopically shown to be a soft fibroma and had its origin in the left sphenoidal sinus was removed. In the operation reported a recurring growth from the same sinus was removed. The first growth consisted of two polypi attached by separate pedicles to a common stalk, and the second of two polypi on separate pedicles.

O. M. ROTT.

### THROAT

**Masland, H. C.: Mechanical and Physiological Considerations in Tonsillectomy.** *N. York M. J.*, 1919, cx, 277.

Masland makes a plea for the skillful removal of the major portion of the tonsil, leaving a shallow layer of tonsil and the capsule in most cases, and reserving the complete removal of the tonsil and capsule for the small minority of cases.

This stand is taken (1) because of the interference with the mechanophysiological functions of the voice caused by complete tonsillectomy, and (2) because of the possibility that the tonsil may have a function which is not yet fully understood.

O. M. ROTT.

**Grant, J. D.: A Case of Pharyngeal Diverticulum Treated by Dislocation and Fixation in the Upper Part of the Neck.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 156.

Grant treated a pharyngeal diverticulum by fixing it in the upper part of the neck as follows:

An incision was made along the anterior border of the sternomastoid which was retracted inside its sheath. It was then slit up so as to expose the deep parts of the neck, the omohyoid muscle was divided, the great vessels were drawn outward, and the larynx and trachea drawn inward. In this way the thyroid gland was exposed. Close behind it was a swelling

consisting of the pharyngeal sac which dipped very deeply down behind the manubrium sterni and was adherent to the surrounding tissues. When detached by the finger and pulled up into the wound it was found to be about the size of a very large human tongue and apparently thick-walled. It was stitched into the upper part of the operative cavity without puncture of its walls, and the wound then closed except at the lower part where a rolled India-rubber drain was introduced. The latter was left in place for two days, there being very little discharge. A small tube was kept in the stomach for twenty-four hours. After its removal the patient was able to swallow with perfect ease and has had no difficulty since.

O. M. ROTT.

**Syme, W. S.: The Removal of the Larynx for Malignant Disease.** *Proc. Roy. Soc. Med.*, Lond., 1919, xii, Sect. Laryngol., 109.

Syme describes a laryngectomy for malignant disease which was followed by good results. The cut end of the pharynx was stitched to the root of the tongue and the floor of the mouth. For five weeks the patient was fed by a tube passed through the nose. He has now resumed his work and has a good pharyngeal voice.

O. M. ROTT.

**Barajas, L.: The Treatment of Laryngeal Neoplasms with Radium** (Tratamiento por el radium de las neoplasias en la laringe). *Med. Ibero*, Número extraordinario, 1 Cong. nac. de med. y cirug., 101.

As they are still uncertain, the results of the use of radium in laryngology are at present being carefully watched.

The radium should be placed in the larynx *in situ*, using the gamma rays and avoiding the stimulant action of the secondary rays.

Cases of spreading epithelial tumors evidently undergo a process of amelioration, even to an apparent cure, after the first applications of radium if the dosage is adapted to the case and the subject. In all of the cases observed by the author, however, the tumors re-appeared in a very short time and in 58 cases not one complete cure was obtained.

Radium exerts a positive retarding action on the growth of neoplasms, in some instances causing an encysted lardaceous degeneration.

Its analgesic action in moderate doses is evident and constitutes one of its most important benefits.

The use of radium does not change the indications for operation which is the best treatment, but it is particularly valuable in the treatment of patients who refuse operation.

It is not known to what extent postoperative applications influence recurrences because those in whom recurrence has begun go on in the same way in spite of the radiation, and when there is no recurrence we cannot be sure whether this condition is due to successful surgery or the radiation.

The dosage of radium is important. In the author's observations he found that the quantity should



not be less than 45 or 50 milligrams nor more than 75 or 80 milligrams, with a maximum duration of two hours each session.

The applications should be as frequent as the reaction of the organism after treatment will permit.

The reaction is the more rapid and intense the greater the amount of the element that is used and the longer the duration of the session.

In the hæmorrhagic forms of neoplasms the use of radium is contra-indicated as it increases the hæmorrhage from the neoplasm and the area immediately surrounding it.

The pavement-celled epithelioma is the most refractory to radiotherapy and its exacerbations most evident.

The beneficial action of radium is extremely definite in papillomata, absolute cure having been observed in cases of multiple recurrent tumors of this type.

In ulcerative tuberculosis radium is completely contra-indicated, while in lupus its benefit is positive.

Barajas is satisfied that radium merely retards the development of some varieties of epitheliomata, hastens it in others, and completely cures none, but that it greatly decreases the pain.

M. M. MATTHIES.

### MOUTH

**Dittman, G. C.: The Interrelation between Orthodontic Malformation and Disease of the Nose and Throat.** *Minnesota Med.*, 1919, ii, 305.

Dittman states that malformation of the dental arches and maxillæ is an important etiologic factor in many nose and throat affections. He gives a very careful review of the anatomy of the bones forming the face and sums up his article briefly as follows:

1. This is an era which must recognize dentistry as an aid to medicine and medicine as an aid to dentistry.

2. The orthodontist and the rhinologist should be closely associated, and to obtain the best results in the young, co-operation of those practicing these two specialties is imperative.

3. The best results are often obtained when nasal

and throat operations are performed in conjunction with orthodontic correction.

4. Orthodontic deformities and respiratory function are correlated.

M. N. FEDERSPIEL.

**Thoma, K. H.: The Clinical, Roentgen, and Microscopic Diagnosis of Dental Conditions.** *Dental Cosmos*, 1919, lxi, 742.

In Thoma's opinion the average dentist neglects making a thorough examination of the mouth to locate the presence of conditions of which the patient is unaware and which he therefore fails to mention. Years ago dental work was limited to the relief of pain and the restoration of all useful teeth. Extensive bridgework was attached to infected teeth which finally caused severe systemic conditions.

A thorough examination should include: (1) a complete history; (2) inspection of the mouth; (3) an X-ray examination; (4) an instrumental examination to discover the presence of devitalized teeth; (5) a microscopic examination of any pathologic discharges; and (6) a record of the examination.

All conditions must be summed up before it can be decided how radical the treatment should be. The prognosis depends entirely upon the seriousness of the general disease and the extent of the local condition.

Thoma reports several very interesting case histories, giving the findings of the examination, the diagnosis, and the prognosis. M. N. FEDERSPIEL.

**Moorehead, F. B., and Dewey, K. W.: Composite Odontoma.** *Surg. Clin. Chicago*, 1919, iii, 645.

Moorehead and Dewey report a case of composite odontoma removed from lower angle of the left jaw.

The swelling, which was uniform and hard, occupied the body of the bone. The bulging involved the buccal cavity and tongue to an equal degree. The diagnosis was made from the clinical and X-ray examinations.

The mass was removed under local anæsthesia (novocaine) and the wound packed with gauze saturated with compound tincture of benzoin. The tumor measured 3.5 by 2 by 2 centimeters and weighed 20.5 grams. M. N. FEDERSPIEL.



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## SURGERY OF THE EYE AND EAR

### Eye

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## SURGERY OF THE NOSE, THROAT, AND MOUTH

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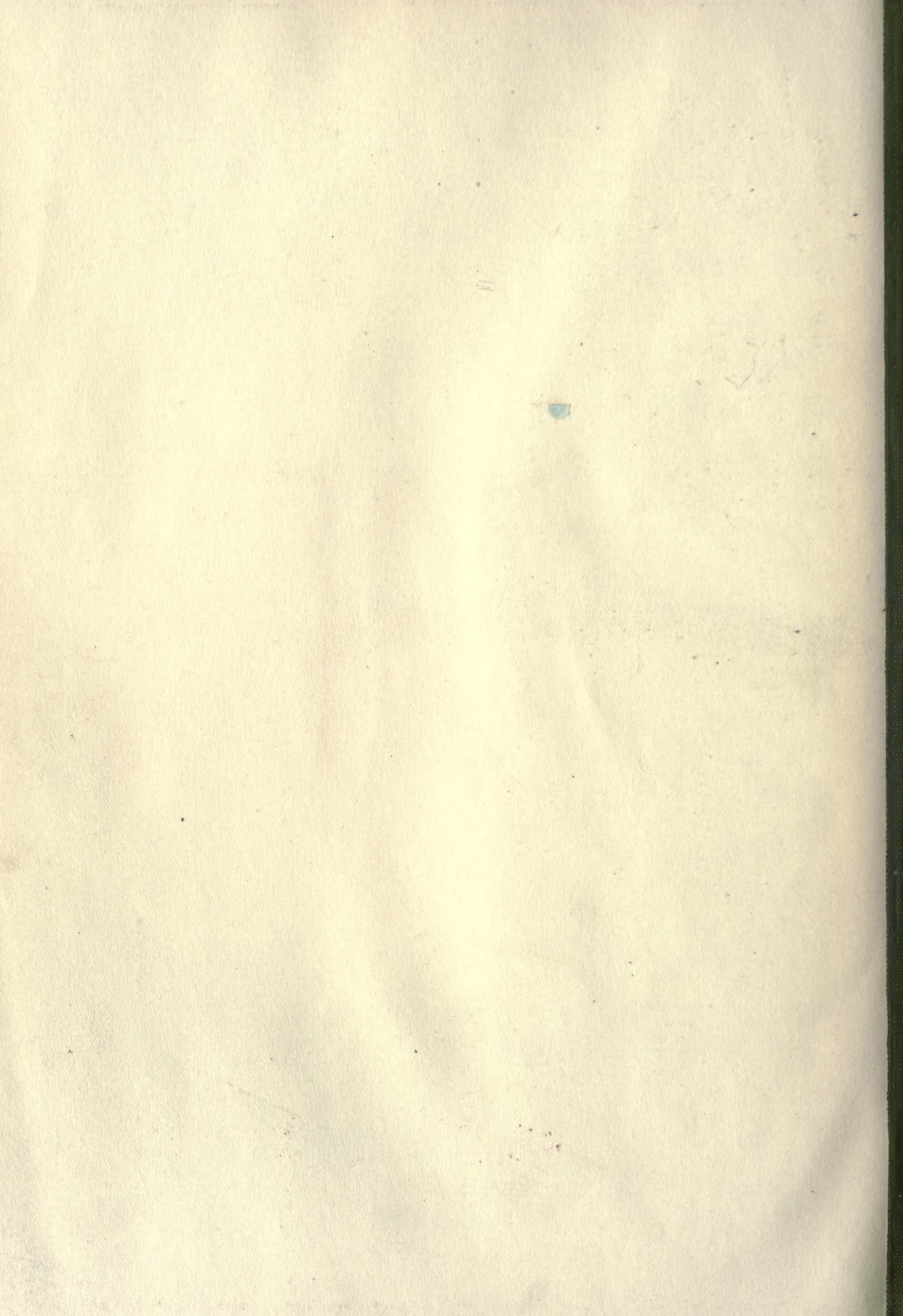














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